1: Lhote--72 E-5 (1929-1940) 1944 MS25 Tuareg MS25

114 forming the tobol" and, by extension, "servant of the tobol."
533 At the present time these three fractions number about 150
631 people.
[162] We call attention to them here only as a reminder.

Book V

Material Life

Chapter 1

Living Conditions Among the Ahaggar Tuareg

133 The Ahaggar, as we have already said, is a mountain refuge. We do not know why the Tuareg have continued to live there when they could have found much better countries to the south where they could have had a much easier life. Perhaps we should attribute this to attachment to the country or, quite simply, to an ancient state of things which forced them to take refuge against their will in the middle of the rocks.

13 A superficial examination shows that the Ahaggar is a very poor
[511] country with negligible resources, which imposes a living standard
[312] lower than the average. The pasture reserves are calculated, as are the water reserves. The subsoil possesses nothing, or almost nothing, which is marketable, except a little salt. Consequently, the possibilities for life there are quite limited. For the inhabitants to live, then, they must have recourse to outside resources.

312 The question of water is fundamental in the formation of the [361 camp, both for the choice of its location and for the number of tents 182] to be included.

Water is obviously a problem for all life; it plays a role in the location of our small European villages, but this role is still greater in desert countries where water is quite rare. The existence of watering places is not only necessary for human life but also for the life of the domestic animals.

137 To this primordial condition of the existence of a watering 182 place must be added the condition of pasture for the domestic 312 animals. Therefore, we see that the establishment of a camp among 361 the Ihaggaren is conditioned by two main factors whose character may vary in time, depending on the seasons and the abundance or scarcity of rain. But in the last analysis the pasture needs take precedence, for, generally speaking, pasture is even rarer than 137 water, since it can sometimes be completely lacking. This need 182 for pasture forces tribes to split up and camps to be dispersed in 361 order to exploit it rationally. The situation is such that there are 621 rarely more than five or six tents in each group. Only the aménokal's [643] camp may number as many as 15 or 20 tents, but this is quite exceptional, involving the question of prestige and social order at the same time. Indeed, the aménokal supports a numerous family, his caliphs, his servants, etc. But this grouping around the chief is quite artificial, and the flocks which the people own are not with them but are /222/ spread out in the mountains, kept by Imrad or servants.

361 The camp is always established rather far from the watering 312 places, for it is preferable to be closer to the pastures. It is often five or six kilometers from water. The animals go there to drink [482 every two or three days, and the people use the occasion to get 492] their water supply, which will be carried in waterskins on their backs 361 or under the stomach of the asses. Tuareg, moreover, do not like 609 to settle near a watering place, for it is always a stopping point for transients, and they avoid making their presence known to strangers.

361 When a state of war existed, concealment was a capital necessity
609 easy to understand. By atavism, it seems that they have taken the
[721] habit of always placing themselves in spots where they escape the investigation of indiscreet glances.

361 They set up their tents on valley terraces, and sometimes in a
[132] valley itself, if they do not have to fear the rains, which usually fall at the end of the summer.

221 Because of the need to seek out pastures, camps are continually
361 being moved. They stay from one to two weeks, depending on whether the grass has been revived by rains or whether it is dry. But these moves are never of any great distance, not exceeding seven or eight kilometers. If we take as an example the Dag Rali tribe which nomadizes in the western part of Koudia, we find the camps set up in the high mountain valleys, as high as 2, 400 meters altitude, in summer. In winter, on the other hand, they settle on the slopes or in the low parts, seeking places sheltered from the wind. This, of course, is in a normal period of average pasture. But during the summer of 1940, following a long dry period, the Upper Koudia saw a great number of its watering places dry up, and vegetation was nonexistent, so to speak. Therefore, all the nomads took refuge in the low parts of the massif, in the Outoul, Eferer, and I-n-Amegel valleys where water was more abundant and where a trace of pasture still remained. At the beginning of September, the whole massif benefited from abundant rains. A week later, all the tents moved into the mountains in order to use the alpine pastures before winter and to save the lower valley grass for winter.

• 312 /223/ The watering places of Atakor are chiefly natural reservoirs (aguelmam) and springs flowing at ground level in the hollows of the valleys. In the middle part, there are mainly rédir (abankor), or little wells, dug less than one meter down in the soil to reach the water layer, which is often retained by rocky sills. These rédir are exhausted in time if rains do not come to renew the water accumulated in the sandy wadi bed. The lower part of the Ahaggar benefits from all the water trickling down from the high mountains

312 and from all the subterranean flows; thus it is richer in watering places. There are rédir, or wells, varying from 5 to 10 meters in depth.

342 The tent. -- This kind of habitation is found from the western Asian steppes to the Atlantic, where nomads have generally adopted the camel's-hair tent. Tuareg, who do not own any camels with long hair, use skins.

The tent is composed of a large awning formed by assembling [281] 30 to 40 wild-sheep or goat hides, with the hair removed and tanned. Because of the scarcity of wild-sheep skins, goatskin and even cow-[184] hide are gradually being substituted for them. Cowhide is used exclusively by the Ioullimmiden Tuareg. The awning is held up by a frame of arches or poles. The Kel Ahaggar, moreover, have two kinds of tents: one with vertical supports and one with arches. The former is more widespread at the present time. It includes a central pole with a wooden ridge tile and six secondary poles placed in a circle. The highest part of the awning is about 1.5 meters from the ground. The edges of the skin hang down almost level with the ground where they are attached by small pegs in order to keep out the sandstorms which are very common in spring and summer, and keep out the winter cold.

The ridge tile on a central pole is especially used in summer when rains are feared, for it gives the proper slope to the awning so that water can flow off. In other seasons this ridge tile is replaced by two poles supporting a crosspiece.

Although one cannot stand inside, the Tuareg tent is spacious 322 enough. The poles are in tamarisk wood, with coarse sculpture, 531 pyrography, and paintings on the upper part. /224/ This type of tent is used by the Kel Rela, the Dăg Râli, and most of the Kel Ahaggar.

[184] The other model is now used only among the Ăgouh-en-Tĕhlé. It appears that the Kel Ăhnet and the Kel In Rhar may still use it, too. The center stake of the type described above is replaced by one or two arches made of éthel /atle? Ed./ roots joined by a

177 marabouts from the Touat who brought with them the system of
241 irrigation by foggara. The Tuareg later grasped the advantage they could gain from multiplying these centers, and so, at the moment of the French occupation, more than forty centers were being exploited.

423 The enjoyment of land appertains to the people who first culti-
241 vated it. Land of itself appertains to the amenokal, but he leases it
[427 out and in return levies an annual tax -- mesk -- on the harvest, in
651] the amount of four guessa of wheat, or about 10 kilograms per garden. The land may thus have as proprietors Imochar or Imrad, indeed Enaden, but Iklan may not hold gardens.

241 Gardens are not cultivated by their proprietors but by Negro
427 tenant farmers, natives of the Touat or Tidikelt, who are called harratin (singular hartani). An arrangement is worked out between them and the proprietors on the following terms: the proprietor furnishes the hartani two loads of millet a year for his sustenance,
●[312] seeds, a hoe, and then pays for digging /245/ the wells of the foggara. Once the foggara has been dug, the hartani is responsible for keeping it up. He sows, waters, harvests, threshes the grain, and keeps one-fifth of the harvest. Furthermore, he has the right to sow on his own account in the irrigation canals and to cultivate several beds of vegetables.

[311] Centers of cultivation are set up on the terraces of valleys when
312 they are wide enough and have old alluvial deposits. The feggaguir
[241] /plural of foggara -- translator/ of the Ahaggar have nothing in common with those of the Tidikelt or those in the Saoura oasis, which pipe water to the gardens from great distances, from the geological faults where it is retained. In the Ahaggar rain water collects in the wadi beds and is stored under the sand. The feggaguir are therefore dug in the wadi bed and seek water at distances varying from one to seven kilometers. The wadi presents a certain slope, and it is necessary to bring the water gradually to the same level or to a level slightly higher than that of the gardens. The feggaguir

312 include a first subterranean part made of numerous wells of depths varying from two to four meters, linked together by a small canal serving as a water conductor; then comes a part on top of the ground in the form of a canal, first at the same level as the wadi, then at a slightly higher level. They empty into the distribution reservoirs (majem), which by secondary canals (seguia) carry water to the gardens to be irrigated.

311 361 [342] These agricultural centers therefore extend along the wadi on both sides of its banks. The cultivators settle near their gardens and live in straw or reed huts or little clay houses.

There are five centers in the high mountains between 1, 500 and 1, 800 meters in altitude, but the majority are located between 1, 200 and 1, 500 meters. Some of them can be lower, such as Silet (730 meters) and I-n-Amegel (1, 030 meters).

245 Some are small date groves such as Silet and Tibeghîn, which have 10, 000 palm trees, Ideles, Tâhârt, and Ăbalessa, but because of its altitude, the Ahaggar does not seem to be very suitable for date growing. The instability of the harratin is also an obstacle to the development of arboriculture which demands continual care. Cultivators who can be here today and gone tomorrow would not be capable of interesting themselves in work from which they could not draw immediate profit. The country would lend itself, however, to rather large-scale cultivation of peaches, /246/ apricots, figs, and grapes. The little center of Tăzerouk has many peach trees, and the center at Tit produces a famous raisin.

134 The Ahaggar soil is of a high quality, owing part of its richness to elements of volcanic origin which make up a large proportion of the alluvial deposits. Furthermore, the climate favors

132 241 agriculture so much that the natives obtain two or even three harvests a year.

24 In the medium altitude centers, they sow wheat and barley in December and harvest it in May. Barely finished with this, they sow millet which is harvested at the beginning of October. In between the natives also engage in kitchen gardening: carrots,

turnips, onions, garlic, pimento, beans, pumpkins, native melons, watermelons, various gourds of local origin, and sometimes lentils. These vegetables belong properly to the cultivator and not to the proprietor of the garden. They are consumed by him, for the Tuareg generally disdain them and eat them only when they are staying in the agricultural centers.

But these centers may be handicapped by numerous climatic factors.

Rains are obviously beneficial when they come at the right time; unfortunately, they most often fall in winter or in summer, seasons which do not correspond to the largest growth of vegetation. The plants benefit from them only when the rains are very abundant and the ground can store up water for several months. But still, rainfall must not be too strong, or else it can cause the wadies to overflow and immediately destroy the feggaguir. It then requires several months to reconstruct them and in the meantime the crops which cannot be irrigated dry up on the spot and are completely lost.

Cold can also have a disastrous effect. Winter wheat does not suffer from it but its development is slowed up. It is much worse for arboriculture, for if it is late and comes after the trees have blossomed, which sometimes occurs in January, it is likely to stop pollination completely. Fortunately, trees in arboricultural centers like Tăzerouk bloom much later and there are only sudden frosts to fear.

/247/ The wind which blows violently in the spring may also hinder arboriculture by knocking down flowers or young fruits, indeed even fruits which are almost ripe. The great hot summer winds endanger the harvest by the intense drying they cause, unless this difficulty is overcome by abundant watering. Now, it is precisely at this time that the flow of the feggaguir decreases as a result of the heating of the soil and the intense evaporation.

It may thus be seen that agriculture in the Ahaggar is subject to many risks and that the harvests may be very variable. The abundance or scarcity of water causes the seeded areas to vary in

162
103

	1911	1938
T-i-n-Ămenser	36	temporarily abandoned
Tifert	50	" "
Essélésékin	30	
T-i-n-Târâbin	15	abandoned

166
621
[648] These figures bring out the weakening of some centers to the advantage of others. Thus, a number of cultivators from Tarahouhaout (where the French post was formerly located) came to settle at Tamanrasset, and the group of little centers in the outskirts of Ăbalessa, Iglen, Tăfarit, etc., has absorbed the groups from other abandoned centers like Tifert, Essélésékin, Ilâman, Tarahananet, etc.

[241
●312] Together these centers number about 400 gardens and 80 feggaguir.

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433 The wheat harvested is partly consumed by the cultivators and chiefly intended for export; it is exchanged at the Touat for dates. The total harvests in the Ahaggar corresponds to only one -fifth of the needs of its inhabitants, even in good years.

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433 There are fifteen agricultural centers exploited in the Ahaggar: Tamanrasset, Tărhaouahout, Tahifet, Tăzerouk, Ideles, Ăbalessa, Hirhafok, Iglen, I-n-Amegel, T-i-n-Ămenser, Amsel, Tigeneouin, Talan-Tedit, Mertoûtek, and Esselésékine.

[166] In addition there are twenty-two other centers which have been abandoned for some years as a result of dryness or lack of manpower: Ăltoklane, Ădenek, Ămrah, Ăbezou, Ăglil, Bloûmet, Déhine, Dar Mouli, Ennedid, Innezal, Ilâman, In Ămertek, Ilafok, Outoul, Ouhet, Souaïka, T-i-n-Târabin, Touakin, Teberbert, Tarahananet, Tahart, and Joraf.

of the average resources of their country and never let their flocks exceed the number of head necessary for the milk needs of their family -- about ten to twelve animals per person. The surplus is consumed or sold to the sedentary people in the agricultural centers.

/253/ The Ahaggar goats give very rich milk which makes excellent butter. The meat, which is a little tough, is eaten boiled, and the hide is valued for making saddle bags, waterskins, and sometimes tents.

The ass. -- The Ahaggar Tuareg have many asses. They do not breed them properly speaking, taking no care of them and letting them reproduce freely. Many Tuareg do not know the exact number of asses they have, for they do not use them all and abandon them in the mountains where they become more or less wild. The young ones, born in the meantime, do not let anyone get near them, and they must be trapped and then trained in order to be used.

These asses running loose, called haoulil by the Ahaggar Tuareg, have given rise to a legend of wild asses. On this subject, Gautier cited the adventure of General Laperrine who had a "wild" ass hunted by his Arab horsemen, only to notice later that the animal had been castrated.

Although there are no more wild asses in the Ahaggar, it is nearly certain that there were some. They were pictured in the rock drawings of the Djorat wadi, and some still exist in Abyssinia where they are called "onager."

The ass is very much at home in the Ahaggar. It is possible that it was domesticated there. The legends of the Ihaggaren have kept the memory of the first inhabitants, the Issebeten, who had only asses and goats.

In their short moves the Tuareg utilize asses to transport baggage, and men and women also use them as mounts. The servants also take asses to replenish the water supply, making them carry the heavy waterskins on their backs or under their bellies.

262 237 The ass is never eaten, and its skin is not used.

233 The horse. -- The horse is not a Saharian animal. In 1929 there were four horses in the Ahaggar belonging to the aménokal. [643 Today there are about twenty of them belonging to the members of 644] his family or to the notables of his camp.

[184 This is an expensive luxury, for these animals must be fed with barley, and there is not enough barley for the people themselves. 262] It tends to replace the camel for the Sudanese Tuareg.

[643] /254/ The zebu. -- A few years ago the aménokal owned a small herd of zebus which he had had sent from the Sudan. This [137] animal is not raised in the Ahaggar proper, and it could not be, for lack of appropriate pasture.

[312] The zebus serve in the agricultural centers by drawing water. They are furnished to the tenant farmer by the proprietor of the land, [427] and they are very poorly fed on hardship rations of hay and grass, or else they are put in rush pastures, which are generally plentiful in the agricultural centers.

[438] When the animal is tired, the owner exchanges him if that is at all possible. The privations which the zebus must undergo bring about their death in a relatively short span of time, and so in the Ahaggar it is a question of keeping them alive rather than raising them. In any case, they never follow the camps in their moves and never live near them.

361 136 When we talked about the camp, we told how the search for pasture directed its location.

233 361 Insofar as animal husbandry properly speaking is concerned, we observe that the small animals -- sheep, goats, and asses -- always stay in the Ahaggar and move with the camp.

As for camels, this is not the case; they are often put out to pasture far from the tents, watched only by a few shepherds. The majority are even kept in the Sudan 800 kilometers from their owners'

1: Lhote--166b E-5 (1929-1940) 1944 MS25 Tuareg MS25

Plate XVI

326

Settled in improvised camps, blacksmiths work in the open air making weapons and utensils needed by the Tuareg.

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●312
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The Imrad women are in charge of taking the flocks to pasture and water. Every two or three days they go to the wells, drawing water for the goats, who drink out of wooden bowls or out of skins used as containers by placing them on mounds of sand in the shape of a basin. They fill the waterskins which will be transported to the camp by asses.

the oases of the Tidikelt and Touat which have none. Thanks to the wells of T-i-m-missao and In Ziza, the sheep succeed in crossing the Tanezrouft without too much suffering.

This trace movement is evidently engaged in only during the coolest months of the year, that is, from October to April, and it demands great precautions from the caravaneers.

Here is a list of the wells, starting from Timelaouine (Adrar des Iforas), where the animals are watered, as well as the number of days of march between them, according to the information furnished us by El Bak el Fassi, the Amrar of the Kel Ahnet.

Timelaouine (well, watering place)		
I-n-Gezzal	1 day	Adrar des Iforas
Efenargh	1 "	
In Ouzzal	1 1/2 days	
Tirek	3 "	Tanezrouft
Ti-m-missao	2 "	
Tin Senatet	5 "	
In Torha	1/2 day	
Aleg'nenou	5 days	Ahnet
Tin Khalifa	2 "	
In Belret	1 day	
El Khenig	1 1/2 days	Immidir
In-Salah	3 "	Tidikelt

Or 26 1/2 days' march.

/313/ Depending on whether pasture is more or less abundant, caravaneers suffer more or less losses in their flocks. Sometimes this loss is complete, sometimes it is none at all.

We saw a Kel Ahnet make the trip at the end of the month of April, a period which is not favorable, with 35 sheep and not have to kill more than one of them on the way.

487 When one speaks of a caravan trail, one must banish the idea of a route more or less arranged to facilitate traffic. The Saharian trails are simply marked on the ground by the tracks which the camels make, passing there in the same place for centuries. In the Ahaggar they look like a long, light ribbon running through the middle of the black rocks. The trail may be made up of two, three, or six ribbons which run parallel to each other, depending on its importance and the lay of the land.

Trails always follow the sides of valleys, naturally linking one well to the other and passing from one valley to another through the most accessible passes. They are never marked out. Of course in some places there are a few redjem, a kind of pile of pebbles to mark the passes or the nearness of certain wells, but these are rare and on the whole recently constructed, for the Ihaggaren have always strived to hide the routes through their country from strangers.

In sandy places and in regolith terrain where the ground is always more or less transformed by the action of the wind, the trail often becomes invisible, and the caravan must then trust to the knowledge of a guide or a man who has already traveled over the road several times and knows it.

Secondary trails. -- There are within the Ahaggar numerous secondary trails which are used for local needs. They all go from one well to another. All the agricultural centers are connected by a network of well-marked trails which are easy to follow without any great knowledge of the country. There are also pasture trails, little routes marked by the repeated trampling of goats going from one valley to the other and winding around the mountains; the animals follow them every day. This network is unbelievably extensive, and one might say that every mountain and every plateau is furrowed by several of these little paths. /314/ They are to be found in the most inaccessible and barest places, which shows that the Ahaggar used to be traversed in all directions,

439 These transactions are chiefly centered around tea, sugar, cloth, perfumes, hardware, carbide, and blankets from the Touat. They cause quite an appreciable movement of camels from which the Ihaggaren benefit, along with the Arabs from In-Salah who rent their camels to traders.

492 Transport. -- We need not repeat that without the camel the Sahara would be uninhabited today. Indeed, it plays a capital role in transport between oases; it is the mount used by warriors and people who are moving and the vehicle for baggage. People would not be able to do without its services the moment it is a question of crossing a hundred or so kilometers in a region not supplied with watering places.

The ass also plays a big role, but its use is more localized. [312] It is confined to the edges of the massif, where it is rare not to find water during a day's march. The ass really assures all internal transport -- that necessitated by moving camps, transport of water [565] and even of persons -- for although the Imochar never travel except on camels, the Imrad /318/ commonly make use of the ass, and their wives know no other mounts. Its role is even more appreciated because it saves camels which, in the Ahaggar, must be submitted /only/ to moderate labor. In addition, it is always handy, for it lives near the camps while camels are often several days' march away because of pasture needs.

Meharists have a special harness: light saddles which are placed on the animal's withers and which are designed to receive the different bags of salt and waterskins.

The Ahaggar Tuareg have several kinds of saddles: 1) the [241] tarik, with the pommel in the shape of a cross and covered with red leather; 2) the tamzak, shaped the same way, but much more [531] luxurious, with the outside of the pommel and the back decorated with little perforated metal plates and copper studs; 3) the tahiast, [531] a coarse saddle with a palette-shaped pommel, either in bare wood [322] or covered with leather decorated with geometric designs.

adopted by all the Tuareg of the Adrar des Iforas, which the Chaamba Arabs also use, and which is derived from the saddle of the Moors of the western Sahara.

Ahaggar noblewomen, who travel only on meharis, have special saddles resembling the basour of the Arabs but without the arch covered in cloth. These saddles are called akhaoui; they are made /319/ of wood and ornamented with large pommels in front and small plaques trimmed with copper nailheads on the side. For long moves these saddles can be provided with a wicker cage covered with cloth, but this is not a common practice.

Saddles hold leather bags which contain either a change of clothes or food reserves as well as the waterskins constituting the necessary provision for crossing regions without wells.

For transport, camels are provided with a special packsaddle made of palm fibers which literally crowns their backbone. Most of these packsaddles are made in the Tidikelt. For caravans which last a long time the animals are loaded with about 100 kilograms, plus the waterskins that are generally added to the baggage. The servants, who accompany the animals and do not have personal mounts at their disposal, /320/ ride on top as excess weight and make the whole trip under these conditions.

The Tuareg are very poor walkers and cannot conceive of a person's going on foot, even to spare the mount for a few kilometers.

Asses, which as we have said are used for transport within the massif, are provided with a little packsaddle serving as a saddle at the same time. When camp is moved, they are loaded with the tent, tent stakes, and bags containing food reserves. They also assure the carrying of water from the well to camp.

When an Amrid travels alone on a voyage, he takes an ass to carry his water, his small baggage, and his blanket. Pushing the ass before him, he walks behind carrying his lance over his shoulders. He mounts on it only during the hot hours of the day.

233 across much of the land and concentrated
[137] along dry river bottoms, and the small patches of thick, lush, emerald green grass that flourish briefly in hollows here and there following rainstorms. Pasturage is always either very sparse or very scattered in the Ahaggar and so the nomadic inhabitants of the area must move often, for the supply in the immediate neighborhood of a camp is quickly exhausted.
[312] To make life still more difficult, water points are often few and far between as we already know, and it is not unusual to find good pasturage so far from any water that it cannot be used for more than a day or two, if at all. This combination of circumstances has
233 made it necessary for the Ahaggar Tuareg
221 to break up into small and highly mobile camp units composed of fractions of clans, or even single families, and each of these units must move at intervals of usually somewhere between a week and a month and often over considerable distances, although always within the territorial limits of the tribe (fig. 36).

As soon as a camp or constellation of neighboring camps is established in a new location, the head men first set up the daily grazing routine of the flocks and then set out at once to scout far and wide in search of the next pasture to be used and the next camp sites that their families will occupy. And so it goes the year around, and so the Tuareg of the Ahaggar are highly mobile nomads by force of circumstances, for they cannot survive otherwise in the region which they have made their own.

565 It is in the compelling circumstances of
233 their environment that we find the roots of
463 the class system of the Ahaggar Tuareg, for,
182 quite apart from the question of mobility, such conditions can be met successfully only by a well conceived and firmly established division of labor. In the Ahaggar it is the nobles of a tribe and the headmen of the vassal clans who ride out in search of new pastures and at the same time act as military scouts, always on the watch for enemy raiders as

[423] *The fundamental difference between the two systems lies in the fact that the basis of land tenure among the Tuareg is not that of the *beneficium* while personal allegiance is not based on the concept of the *comitatus*. The true feudal system of medieval Europe was based on the conferring of privilege by an absolute ruler (or one of his vassals) on a less

2: Briggs E-4, 5 (ca. 1956) 1958 MS25 Tuareg MS25
Hoggar

[P. 228]

[Pp. 222-227 not processed]

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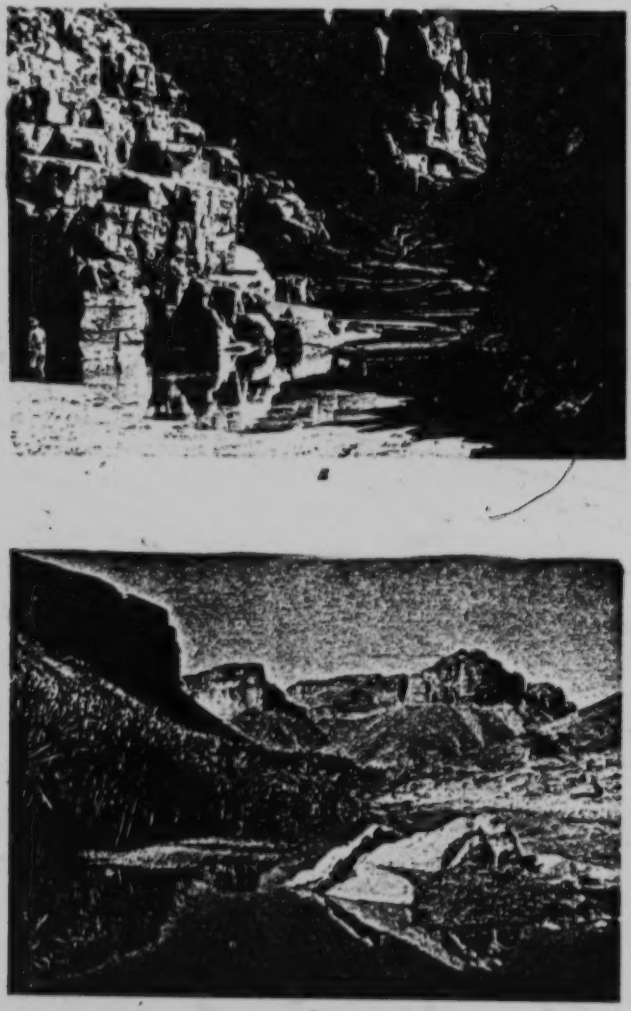

Fig. 11. Waterholes in the Ahaggar. (Photographs by A. J. Weber.)

The donkey carries the waterskins from the well to the tent, and on its back is placed a packsaddle made of curved pieces of wood bound together, which is called "eroukou."

Let us not forget the Tuareg's saddle, "terik," and if the master of the tent is well-to-do, his wife's saddle, "tekhaouit." /28/

The tent is divided in two: one side for the man and the other for the woman. On the man's side are his saddle, his arms, and the things used for eating. On the woman's side are her saddle, her "amz'ad," and the cooking utensils.

Custom decrees that the man choose the east part for his side, and the woman the west part.

A group of tents is called "amezar" ⵜⵉⵣⵔⵉ, and a single tent "ehan" ⵜⵉⵀⴰⵏ, plural "ehanan" ⵜⵉⵀⴰⵏⴰⵏ.

Dautheville

Tent of a Tedjehe-Mellet
at Amra (Black Tifedest)

Chapter XV

Food

The main meal takes place at noon and is called "tarout" ⵜⴰⵔⵓⵜ. In the evening the Tuareg is

The negroes and negresses are well treated by the Tuareg, who do not impose hard labor upon them. The negroes are primarily busy with the flocks, which they drive to pasture and water. The negresses are concerned with the kitchen; they go after water and take care of the children.

Tuareg Watering their Sheep at the Tin Zaouaten Well

Negroes and negresses also gather the harvest of "toulloult" and "afezzou" grains, but this is more fun than work, for everyone takes part in it with them, in gay groups.

Many negroes eventually become the trusted men of their masters, who put them in charge of caravans or even of responsible missions. Thus, the amenokal Moussa had a trusted negro, Chernach, whom he regarded highly, for, he said, "I know that this man would have himself killed for me." Moreover, he gave him a gun, a spear, and a saber. /33/ These negroes are very happy and can consider themselves as freed.

4: Benhazera--56a G-5 (1905) 1908 MS25 Tuareg MS25
Hoggar

000

A'in Redjem in the Botha Wadi
(Immidir)

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312

Tuareg Watering Their Sheep at the Tin-Zaouaten Well

They use camel hair to make rope. They are fond of camel meat, and it is they who supply the markets of the Tidikelt with it. 237 283 262 439

There are very few cattle in the Ahaggar, barely thirty, and almost all these belong to Si Mokhammed ag Otsmane, of Tazerouk. They are used to draw water from the wells into the ar'erems. The pasture is scanty, and besides the cattle easily wear out their hooves on the rocks and stones. 233 492 [312]

In the Koudia, because of the cold which prevails there and the high altitude, there are many small turrets of dry stones, /65/ empty inside, in which the Tuareg confine lambs and kids at night to shelter them from the cold. 233 343

The Ahaggar do not have a large number of meharis, and they do not like to sell them, especially the good ones. Among themselves, to set the value of a mehari, they say, "Such a mehari is worth two, three, or four camels." All their meharis are trained to start at a gallop. The Tuareg has great patience with the training of his mehari and never mistreats it. He confines himself to persuading it by voice and foot, and it is perhaps for this reason that the Tuareg mehari is much more silent than the Arab mehari. 233 [435]

The foundation of the pastures of the Ahaggar is aremmas (Atriplex halimus, Salsolaceae). This plant is quite laxative. So when the year is bad and drought prevails, the Ahaggar are found emigrating toward the Adhar'. There are fine pastures of "had" (Cornulaca monacantha, Salsolaceae) in the south of Tin R'arhou, but there is no water. Moussa ag Amastane /66/ intends to have wells dug there and has requested our help and advice for this purpose. 137 233 [312 648]

As a rule the Tuareg let their camels out to pasture without herders, and they find them again at the well or by tracking, unless they entrust the herding to children or negroes. 233

/67/ A young camel is called "abal" without designating its age. A camel in general is called "amadjour," plural "imoudjar," or else "amiss," plural "imnass." A female is 192 233

4: Benhazera--57b G-5(1905) 1908 MS25 Tuareg MS25
Hoggar

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Tuareg Watering Their Sheep at the Tin-Zaouten Well

[192]

Names of Camels in Tamashek (according to their age)	Names of Camels in Arabic (in the Tidikelt)
1st year: *Aouara.*	1 to 6 months: *H'ouar.*
	6 mos. to 1 year: *Mekhloul.*
2nd year: *Aledjoudh.*	2 yrs.: *Ould tkoum.*
3rd year: *Airggue.*	3 yrs.: *H'eugg.*
4th year: *Aqnefoud.*	4 yrs.: *Djedaâ.*
5th year: *H'air.*	5 yrs.: *Teni*
6th year: *Eg essine.*	6 yrs.: *Rebaâ.*
7th year: *Eg okkoz.*	7 yrs.: *Sedass.*
8th year: *Amezzedis.*	8 yrs.: *Bou fettra.*
9th year: *Tahellat.*	9 yrs.: *Bou fettertine.*

Many legends circulate about blacksmiths. They say that 326
because they work with iron and fire, they will go into the fire 565
of hell. They are scorned, first because they devote themselves
to a manual craft, a disgrace in the eyes of a Tuareg, and
secondly because it is said that they are of Negro origin. It is
also claimed that they were pagans and that their conversion
to Islamism is not sincere. They are also taken for sorcerers. [754]
The sheik Ben Djellas (see the Appendix /not translated/) says
of them: "Blacksmiths hate God and his Prophet, and they
betray God and his Prophet." Their ancestor was called
Tamamenet.

The blacksmith does not belong to any tribe. He goes
where he pleases, wherever he finds work. Sometimes he goes
to war, and he is said to fight well, but a noble Tuareg will not
cross swords with him.

In the Ahaggar a blacksmith is called "mr'allem," variation 326
of the Arab "maâlem." However, there is a word in Tamashek [192]
for him, "inedh," plural "inedhane," but it is not used. /73/

At Tamanrasset I was shown many ancient graves (of the [764]
"chouchat" shape) which, it seems, were the burial places of
a tribe of blacksmiths said to have been massacred and died of
starvation a very long time ago.

The gardens of the Ahaggar "ar'erems" are worked by the 241
Harratine of the Touat and the Tidilkelt, who bring their tools 312
with them. It is they also who dig the "foggaras," or covered 565
wells, and all the tools that they use come from the Saharan Oases.

Chapter XII

Agriculture. Ar'erems

While in all of the Ahnet no trace of agriculture is to be 241
found, however small, because of the scarcity of wells, whose 361
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output is only enough to water the flocks, in the Ahaggar, on the contrary, a mountainous country where there is some water everywhere, a number of small villages called "ar'erem" ⵄⵔⵔⵉⵎ, plural "ir'ermane" ⵉⵏⵔⵔⵉⵎⵏ, have been built.

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Since the Tuareg, nobles or imr'ad, dislike all manual work, these villages could not have been built without the indispensible help of the Harratine of the Touat and the Tidikelt, whom the Tuareg call "Izeggar'en" ⵉⵣⴳⴳⴰⵔⵉⵏ, meaning "mulattoes." Everything was made by the latter: the wells, /74/ "tounine," which are used for irrigation, as at Tazerouk; the "foggaras," or covered wells, "ifelane," and their irrigation canals as at Abalessa, Tit, and Tamanrasset; the fitting up of springs, as at Tadjemout. The Harratine made the gardens and became khammès of the Tuareg, landowners. They settled in these villages and there built huts of "diss" (Imperata cylindrica) or of "berdi" (Typha angustifolia) and little houses of baked earth.

[342
824]

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The Harratine grow wheat, barley, and bechna in these gardens. These are the three essential crops, to which they add some vegetables: onions, kabouyas, or gourds, watermelons, and "guerroum" (a kind of long melon which is eaten green, like a cucumber, before it is ripe). Finally, at Tit they /75/ have planted some fine fig trees and a vine which yields a grape that seems delicious at this latitude. Similarly, at Abalessa, there are some vine slips and a fine palm.

Ideles (Koudia)

The gardens, or rather the fields, are enclosed by a hedge to prevent the depredations of the camels that graze free at night. But there are some that do not have this protective barrier, and the Harratine are forced to stand guard at night, turn, and turn about, lighting fires to drive the camels away from the crops.

241 Usually, there are six khammès per field, and each of
●312 them has a right to water for one night and one day. The water, brought from the foggara, spreads into the "madjens," or reservoirs, as on the oases, there to be divided among the gardens by means of saguias, or irrigation canals.

[764]

Herhafok Region

In the Left Foreground an Ancient
Grave in the Chouchat Form
(Koudia)

241 The khammès receives as his pay:

1. A fifth of the crop
2. The barley which he sowed in the irrigation canals
3. A load of wheat in winter and a half load in summer,

for his personal consumption.

245 In the Ahaggar there are also small oases of palms which were planted by no one knows whom, for example, at Tibedjehine and at Silet (Ahaggar), at Djor'raf, Tafarakrak, and Teguift (Immidir). The Tuareg who own them leave them
[423] untended and are satisfied to go and gather the dates when they choose. These palms, which get no care, also have a great mass of dry djerids hanging to the ground, which makes it very difficult to climb them. Perhaps this is to prevent theft of the dates? /76/

From the fact that these palms, even though not cared for, produce dates which, if not of good quality, are still quite

5; Nicolaisen E-4, 5 (1951-1955) 1959
MS25 Tuareg MS25
Ahaggar
Air

paratively rich vegetation of Air contains species found also in Ahaggar, but Ahaggar has Mediterranean plants including several saline species which do not thrive in Air, where there are tropical or Sudanese species unknown to Ahaggar. 137

Botanically Air is very closely connected with the Sudan, and the mountain massif is within the Sudanese zone of summer rain. It is true that rain at the northern outskirts of Air occasionally falls in winter and may then give rise to scattered pasture of annual plants, but these rains are of no real importance. The important rainfalls of Air occur in the period June–September, and particularly in July and August. As may be gathered from the description of botanical conditions, Air has a much bigger annual precipitation than has Ahaggar. Thus the village of Iferouan in Northern Air has 74 mm, while Agadez at the southern slopes of the massif has 179 mm. Precipitation will of course vary from one year to the other, but rain will always fall sufficiently for the spring of annual plants. This is the reason for a type of stock-breeding different from that of Ahaggar. In Air the Tuareg are richer in camels, they do not possess so many goats but are very rich in sheep, and most of them have zebus. 132 137 [233]

The climatic and botanical differences of Air and Ahaggar can be seen more directly from the division of the year into seasons (fig. 2). Air has a summer and a winter season between which there are two seasons termed *akasa* and *farat*. These two words as seasonal terms express the fact that rain and annual pastures in Air are recurrent events, as the word *akasa* literally means "green annual plants", and the word *farat* refers to "dry annual plants". Both words are known also to the Ahaggar Tuareg but are by them not applied as seasonal terms, for in their country rain will not occur every year and may fall at most seasons. 132 805

Conditions for stock-breeding are very much better in Air than in Ahaggar, but the latter country has a few superior qualities:– 1) Part of the year Ahaggar has a comparatively cool climate which is said to have a positive influence on the lactation of domestic animals. 2) In Ahaggar all over the country there are saline pastures which play an important part in stock-breeding – not because these plants are very nourishing but the animals do not thrive without salt. In Air saline plants are very rare and found mainly to the south and south-west of the massif where water and soil also contain salt. Many pastoralists will migrate to these regions shortly after the rains, while people who do not undertake such migrations feed their domestic animals with salt. Camels and cows have a particular need for fodder with a salt content. 3) Ahaggar has richer wells and a greater number of permanent ponds than Air. This may seem rather peculiar as precipitation is much bigger in the south than in the north. In Ahaggar and Tassili-n-Ajjer some ponds may contain fish, apparently unknown in Air. In the latter country there are a great many ponds or even small lakes during the rains but they dry out very quickly when rainfall ceases. Water in Air most of the year is drawn from wells many of which go dry during the hot season; this will frequently lead to quarrels between nomads. 233 [132] [135] [137] [221] 312 [136] [578]

5: Nicolaisen E-4, 5 (1951-1955) 1959
MS25 Tuareg MS25
Ahaggar
Air

262 Even when grazing is good stock-breeding products are less important for food
[222] in Ahaggar than in Air as is illustrated in fig. 3 depicting the relative importance of milk food and vegetable food. A small part of the vegetable food is provided by collecting seeds of grasses and herbs, while roots, stems, and berries of wild plants are less significant. The bulk of Tuareg plant food consists of millet, barley, wheat,
[241] and dates. In Ahaggar many Tuareg have gardens with wheat and barley cultivated
[563] for them by black-skinned agriculturists generally known by the Arab word
438 *Haratin* (*Izzegaren* to the Tuareg). But most Ahaggar Tuareg acquire the bulk of
262 their plant food from caravan trading with the oases of Tidikelt (dates) and with Sudanese villages as far south as Zinder (millet). Even in years of drought they can obtain millet from the Sudan in exchange for rock-salt broken at Amadror north-east of Ahaggar. In Air caravan trading with salt seems less necessary to Tuareg subsistence, although there are also in this country Tuareg who trade with salt from Amadror or Bilma. Most pastoral households however have a fairly regular
[234] surplus of livestock, butter, and cheese which can provide for the necessary amount
[563] of millet bought in Agadez or south of the massif in Damergou. There are also
241 in Air a great many negroid agriculturists from whom pastoral Tuareg can buy
262 vegetable products. But millet, which forms the prominent part of Tuareg plant
[438] food, is grown to a very slight extent by the agriculturists of Air. Dates are important in particular to the Ahaggar Tuareg who acquire large quantities from the oases of Tidikelt. There are also a few Ahaggar clans the members of which own half-wild palms with dates of an inferior quality, as there are Tuareg who have a few palms growing in their garden plots. In Air dates are not so important for food but even there pastoral Tuareg may have some palms. Among the Tuareg of Tassili-n-Ajjer it is very common for pastoralists to sow wheat and barley in the river valleys when these have been heavily flooded (Nicolaisen 1954, p. 83, 88), and this primitive agricultural method was apparently known also to the Ahaggar Tuareg in the past (Duveyrier 1864, p. 372). More recently many pastoral Tuareg
[312] of Ahaggar and Air have taken up agriculture by means of irrigation. There seems
[321] to be a tendency towards semi-nomadism among the Tuareg who are very dependent on vegetable food derived from agriculture.

The Negroes Of The Sahara.

136 In the above section on Tuareg ecology it is stated that Air climatically and botanically is closely linked with the Sudan. This is true also zoologically as the Air fauna contains a great many species of birds and mammals characteristic of tropical Africa. The bird life of Air seems very akin to that of the Sudanese savannah, and, for instance, guinea fowls are extremely common even in valleys of the northernmost parts of the massif. As examples of tropical mammal life in Air we may here mention that the wart-hog lives in Central Air, and that oryx antelopes

[TEXT CONTINUES ON P. 76]

5: Nicolaisen E-4, 5 (1951-1955) 1959
MS25 Tuareg MS25
Ahaggar
Air

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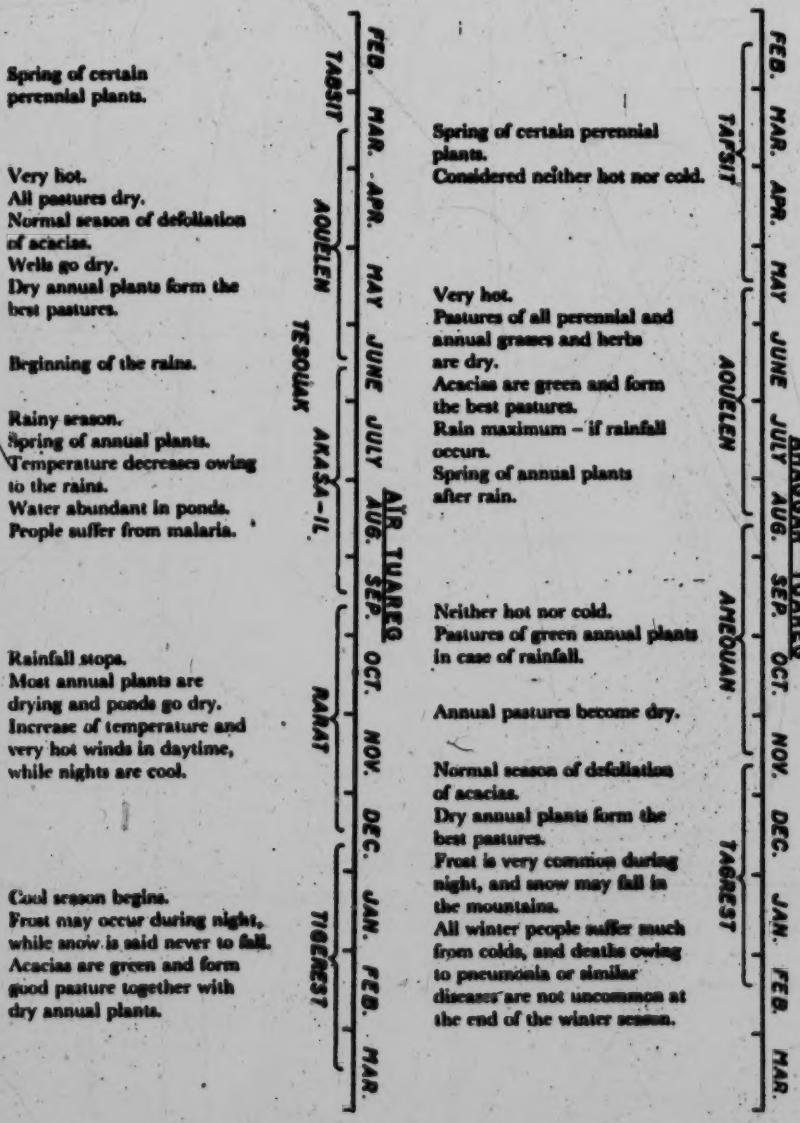

AIR TUAREG
FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC. JAN. FEB. MAR.
TABSIT
AOUELEN
TESOUAK
AKAŠA-IL
RARAT
TIGEREST
Spring of certain perennial plants.
Very hot.
All pastures dry.
Normal season of defoliation of acacias.
Wells go dry.
Dry annual plants form the best pastures.
Beginning of the rains.
Rainy season.
Spring of annual plants.
Temperature decreases owing to the rains.
Water abundant in ponds.
People suffer from malaria.
Rainfall stops.
Most annual plants are drying and ponds go dry.
Increase of temperature and very hot winds in daytime, while nights are cool.
Cool season begins.
Frost may occur during night, while snow is said never to fall.
Acacias are green and form good pasture together with dry annual plants.
AHAGGAR TUAREG
FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC. JAN. FEB. MAR.
TAFSIT
AOUELEN
ANEOUAN
TAGREST
Spring of certain perennial plants.
Considered neither hot nor cold.
Very hot.
Pastures of all perennial and annual grasses and herbs are dry.
Acacias are green and form the best pastures.
Rain maximum – if rainfall occurs.
Spring of annual plants after rain.
Neither hot nor cold.
Pastures of green annual plants in case of rainfall.
Annual pastures become dry.
Normal season of defoliation of acacias.
Dry annual plants form the best pastures.
Frost is very common during night, and snow may fall in the mountains.
All winter people suffer much from colds, and deaths owing to pneumonia or similar diseases are not uncommon at the end of the winter season.

[164]

[164]

Fig. 2.–Division of the year into seasons among the Tuareg of Air and Ahaggar. Climatic and botanical characteristics are indicated. (The proper spelling of *tagerest* (tigerest) is *tagerest*, (tigerest) while *rarat* should be written *parat*).

5: Nicolaisen E-4, 5 (1951-1955) 1959
MS25 Tuareg MS25
Ahaggar
Air

and giraffes are found in the plains immediately south and west of the massif. I do not wish here to compare in detail the natural history of Air and Ahaggar. But I wish to emphasize the fact that climatically, botanically, and zoologically an important dividing line runs between these two Tuareg countries. This should not be overlooked in an anthropological description of these parts of Northern Africa.

At present both fair-skinned Europids and black-skinned negroid people live all over the Sahara, and are frequently mixed. There seems to be little doubt that in the north most negroes have come in with the slave trade. We cannot entirely exclude the possibility that part of the northern negroes constitutes an ancient population of the Sahara (cf. Capot-Rey 1953, p. 167ff.), but in Ahaggar the negroes seem to have arrived later than the fair-skinned Berbers. Until a hundred years ago all negroes of Ahaggar where apparently Tuareg slaves bought or captured in the Sudan, but the negroid Haratin then immigrated from Tidikelt to make gardens for the Tuareg. They introduced the irrigation system known to the Tuareg as *efeli*, to the Arabs as *foggara* (i.e. irrigation by means of subterranean aqueducts), but the solid houses built of mud *(tafahami)* so characteristic of the northern oases were apparently not introduced by the first immigrants of Haratin, but later. Another immigration of negroid agriculturists came from Tassili-n-Ajjer and in particular from the oasis of Djanet. It is not quite certain whether they came before or after the Haratin. They are said to have introduced irrigation by means of wells *(tanout)* from which water is drawn by zebus (or donkeys), and two particular types of dwellings are also ascribed to them, namely a subterranean or semi-subterranean dwelling *(edamous)* and a square hut *(ekeber)* covered with straw or rushes. Immigrations of predominantly negroid agriculturists from Tidikelt and Djanet take place also in modern times, but all the present agriculturists do not descend from immigrants of these regions. A large part of them are descendants of Tuareg slaves manumitted by their masters.

Negro slaves have also been introduced from the Sudan to Air by pastoral Tuareg, but there is no doubt that Air originally was a pure Sudanese country anthropologically, as it is Sudanese with regard to climate, botany, and zoology. In other words, the oldest known inhabitants of Air were negroes while the fair-skinned Berbers have arrived at a later date. It is stated both by Nicolas and Urvoy that Air before the Tuareg was inhabited by negroid Hausa or Proto-Hausa (Nicolas 1950a, p. 45. – Urvoy 1936, p. 138ff.), and Barth claims the word *Air* to be relatively late and of Tuareg origin, the word *Azben* also used as a name of the massif to be of Hausa origin and older (Barth 1857, I, p. 369). My investigations fully confirm these statements. All Tuareg questioned about the history of Air seem to admit that the negroid agriculturists have lived in the country before the Tuareg, and there are in the Berber dialect spoken by these people a great many Hausa words. It is, I think, of particular interest that the negroid village population of Air is said to have a kinship system quite distinct from that of all true Tuareg while

5: Nicolaisen E-4, 5 (1951-1955) 1959
MS25 Tuareg MS25
Ahaggar
Air

563 601 akin to the system in use among the black-skinned citizens of Agadez. These people draw no distinction between parallel cousins and cross-cousins, while distinct terms for these relatives are characteristic of true Tuareg systems (fig. 8 9).

563 342 The material culture of the Air negroes is marked by both northern and southern traits. The most common type of dwelling is a beehive hut *(tatramt)*, which I have also seen south of Air in the savannah, while similar huts are unknown to the north in Ahaggar and Tassili-n-Ajjer. The huts are often placed within round enclosures which are possibly of Sudanese origin (cf. fig. 15). There are however other types of dwellings in the Air villages. Very common is a square straw hut *(tachira)* with a slightly elevated saddle-roof. It is built by the men while the beehive hut is made by women, and both types are frequently used by one and the same household. This square hut differs constructionally from the straw huts used among settled agriculturists in the north. Also rather common is a barrel-vaulted hut *(ehen)* covered with mats (fig. 14). It has the same name and is of much the same construction as the movable huts or tents used by most pastoral Air Tuareg (fig. 5 & 13). It is built by women and seems to have been introduced by pastoral [462] women married to settled agriculturists. Finally there is in some villages a rectangular house *(tarachamt)* with a flat roof. It has very solid walls generally built from stones inserted in and covered with mud. It has various sub-types more elaborately described by Rodd, who considers these houses to be of northern origin (Rodd 1926a, p. 240ff.). They have most probably been introduced from Tassili-n-Ajjer 177 312 or the Fezzan from which regions came also the irrigation system now forming the basis of agriculture all over Air, namely the drawing of water from shallow wells *(anou)* by means of zebus. This system is extremely common in the Fezzan and Tassili-n-Ajjer from where, as mentioned, it was introduced also to Ahaggar. It is not known when it came to Air, but in many villages it has been adopted only very recently. Not so many years ago water for irrigation in most villages was apparently raised by human power, namely by the pole and bucket provided with a counterweight *(aroudit)* (cf. Capot-Rey 1933, p. 322), but this method has now disappeared. It can be considered the oldest irrigation machine and it is no doubt [174] of very great age in Northern Africa including the Sudan. The method however 241 involves much strenuous work and in view of this it may seem quite natural that agriculture in Air was in the past also practised as shifting cultivation without any irrigation. Rodd states that in certain areas of Air rain-grown crops could be raised most years and that in the past a fair amount of cereals seems to have been produced in this way (Rodd 1926a, p. 133). I think this is correct. Certain crops as for instance millet has a very short period of growth; in Ahaggar (Abelessa) millet is sown in June-July and harvested in September, and it is said that it is not watered very much and never to the same extent as wheat grown in winter. It would no doubt be possible to grow millet in many parts of Air without artificial irrigation during the rains, and in fact millet was grown by shifting cultivation not far from Agadez as recently as up to the French occupation. But nowadays agri-

5: Nicolaisen E-4, 5 (1951-1955) 1959
MS25 Tuareg MS25
Ahaggar
Air

culture is never practised without irrigation. Rodd thinks that the Air agriculturists gave up shifting cultivation because they are too poor to-day to risk losing their seed in the event of inadequate or irregular rainfall (Rodd 1926a, p. 133). I rather think the reasons are that the agriculturists of the massif nowadays grow very little millet and have a better irrigation system than in the past. In summer maize forms by far the most important crop, and it needs irrigation which is comparatively easy when using zebus for drawing water. However this may be we can assume that a type of agriculture related to Sudanese shifting cultivation was formerly important to the Air agriculturists, and although irrigation is nowadays used everywhere agriculture in certain places of Air is still a kind of shifting cultivation. Many agriculturists do not resort to manuring nor do they carry fresh soil to the gardens as in Ahaggar. With crop rotation they utilize one and the same plot for a few years but then have to cut trees and brush-wood somewhere else to make a new garden. A new well must then also be dug, but as irrigation wells are rather shallow this work is comparatively easy.

There are in Air certain agricultural implements related to those of Sudanese farming cultures. We must mention in particular a small hoe hafted by means of a thong *(tagoumit)*. It is unknown both in Ahaggar and Tassili-n-Ajjer as well as further north in the desert while extremely common among Sudanese shifting cultivators. Feilberg has classed it with the so-called Old Sudanese Culture established by Baumann (Feilberg 1934, p. 260ff. – Baumann 1940, p. 50ff.; 1944, p. 213ff.). Baumann claims that this culture did not know the sickle, considered by him an implement of the so-called Young Sudanese Culture (Baumann 1940, p. 56ff.; 1944, p. 283ff.). The sickle (Air: *elegesouar*, Ahaggar: *amreh*) is in fact unknown in many Air villages, and is according to my investigations not generally used for the harvesting of crops but for cutting annual grasses to be stored for fodder. In Air the harvesting methods are as follows:– millet is cut with a knife, maize is cut at the root by means of the above-mentioned hoe, while wheat and barley are pulled up with the hands. Similar harvesting methods seem to be known in the Sudan (Baumann 1944, p. 295ff.). As a Sudanese trait we can perhaps also recognize the large clay amphoræ used for the storage of cereals (Rodd 1926, p. 317. – Nicolas 1950a, p. 146).

We can conclude this section as follows:– While the negroes of Ahaggar apparently have arrived in that country later than the fair-skinned Berbers the oldest known population in Air were Hausa-speaking negroes subsisting predominantly as agriculturists. Their original culture apparently was closely related to that of Sudanese shifting cultivators. Contacts with the north and in particular invasions of fair-skinned Tuareg have changed their cultural position. Mixing with the Tuareg they have also changed their physical type, but they are still predominantly negroid. They have adopted a Tuareg dialect but have retained part of their old vocabulary.

132 /23 cont./ The kranka reappears, a sign of less aridity; the tahlas are fairly dense in the wadis; the gueltas /pools/ rarely dry up and are bordered with berdis /Formium tenax/. The wild sheep is a permanent resident of the summits.

There is still less information about the tassilis of the south. Facts are almost nonexistent for the Tassili n'Ahaggar. There is information given by the Tuareg about the Tassili de Tin-Reroh and the Tassili de Timissao, which are situated on caravan routes coming from the Adrar des Iforas toward the Tidikelt or the Ahaggar. They chiefly report summer rains, and rains abundant enough to engender acheb /pasturage/.

These tassilis receive little water from the "tornado tails" because of their medium altitude. However, it rains in the summer nearly every year. The wells of Tin-Reroh and Timissao are never dry. The Tin-Reroh guelts /pool/ sometimes is.

Although not a tassili, the northern border of the Adrar des Iforas has the same sort of climate. This section is of vital importance to the Tuareg of the Ahaggar, who /24/ graze their she-camels there. Summer rains occur regularly; the Sudanese monsoon causes periodic floods. The gueltas in the wadis fill up in the summer and may still have water when the next floods come. Gergir provides abundant pasturage; it lasts nearly all year. Ethel and tamarisk are dense in the wadis, and tahlas begin to grow on the hillsides. The flora of the wadis is more varied. Gazelles are plentiful; one sees Robert's does, oryx and addax antelopes. This is certainly the most favored region in the territory of the Ahaggar annex, but geographically it is already the Sudan.

Water in the Ahaggar

133 312 [132] As in every desert region, the question of water is of primary importance. The Ahaggar is relatively favored by rains. Water points are numerous in the mountainous regions of the

133 /24 cont./ central core and of the tassilis. From this point of
312 view, then, it is easy enough to travel through those regions. But it is an entirely different story for the zone between the Atakor and the tassilis.

Wherever there is water, the landscape in the Ahaggar is transformed; an intense animal life develops; around the water points grows vegetation that seems luxuriant in contrast with the rest of the country. This thin trace of life has something touching about it, something timid and intimate in comparison with the grandiose face of the desert.

As a result of the crystalline nature of the soil, there is no artesian water table. The only hope of finding water is in the wadi beds, under the alluvial deposits, at depths varying from .20 to 15 meters. Occasionally, when the water table under the wadi is abundant, it flows out freely at a rocky shelf which forms an underground dam; such an outflow is called tiggert in Tamashek. When after a tiggert water accumulates in rock basins and the "potholes" of the rapids, there are gueltas (aguelmam in Tamashek) in which live fish and an entire aquatic fauna. As far as I know, there are only rare /25/ springs in the Ahaggar: we may cite the Chapuis spring near Tamanrasset, which flows from the granites of the Adrar Haggarène. Limestone deposits in certain wadis of the Tahalra permit the supposition that thermal springs may have existed formerly.

Nearly all the wadis originate in the central Ahaggar, the zone where the water is distributed. Two very large quaternary wadis, the Igharghar wadi and the Tamanrasset wadi, drain the waters of the west and north. The Tin-Tarabin wadi and the Tin-Amzi and Zazir wadis take the waters from the south and southeast slopes toward the Tamesnar, in the Azaouak wadi, a tributary of the Niger.

The Ahaggar wadis appear as a succession of basins descending from the summits like a giant staircase whose upper steps receive the water which sustains the only permanent vegetation of the country and which permits man to exercise his ingenuity

133 /25 cont./ in creating gardens. The lower steps, which spread out enormously, are dead to all sedentary life.

312 The Tamanrasset wadi affords a typical example of the Ahaggar wadi. Its source -- or more exactly, its head -- is at the Asekrem, nearly 2, 765 meters high; its mouth, that is to say, the last drainage basin, spreads out and loses itself in the Tanezrouft, at an altitude of 400 meters. Its present length is approximately 750 kilometers; if, in the quaternary period, the Tamanrasset wadi emptied into the Taoudéni depression, it must have measured more than 1, 400 kilometers. The descent in the upper part of its course is very steep, for at Amsel, 160 kilometers from its origin, the altitude has already dropped to 900 meters.

From its source down to Amselka, or about 200 kilometers, one may say that the Tamanrasset wadi is living: it has a distinct valley, the passage of the water is clearly marked; one sees terraces with clear-cut borders, and the valley is often cut in V shape. However, certain basins, such as the one at Tamanrasset (the village) give a preview of the large drainage zones downstream, evidence of a former, more humid epoch.

/26/ The description of this part of the wadi is merely an enumeration of the transversal valleys it cuts across; each of these has a corresponding rock shelf which is at the end of each basin.

In following the descent south of the Asekrem, one goes along a drainage trough which, after a kilometer, has already cut a ravine with sharply vertical sides from four to five meters high. The course then spreads out very wide, then comes a 20-meter fall into a basalt corrie with vertical columns reposing on the alluvial deposits; the valley continues, forming a canyon 60 meters wide and 30 meters deep. At this point the wadi takes the name "Tarhoumout"; it crosses a transversal valley after Mount Oul, the rocky shelf crops out, and abankor /water holes; are dug here.

133
312

/26 cont./ The wadi runs toward the south, then turns eastward: there is then a series of rapids in a gorge where the permanent gueltas of Lundien are found. Then there is a new bend to the south, the valley runs along the Akarakar, narrows, and there is a new rock shelf and the guelta of Ifelouen.

The wadi leaves the Atakor in cutting a passage between the Isekram and the Ahounahampt. It empties into the site of Tamanrasset, where it widens, takes its final name, and receives its first important tributary, the Irharhar Tekecherouet, in which are found the "grand gueltas."

By the Iharen peak the rock is grooved in a corridor 15 meters deep and one or two meters wide for about 200 meters distance. Afterward the wadi is 400 meters wide. Foggaras /subterranean channels dug to tap underground water/ are dug in its bed; they irrigate the gardens of Hadriane and Tamanrasset, and of Tihegouine, a small agricultural center a kilometer downstream from Tamanrasset.

The valley soon widens but remains hemmed in, then narrows again at Tagrambait, where a garden nourished by a foggara is found a little before an outcropping of rock. The valley then widens once more and reaches 600 meters across.

From this point on the wadi is always very wide, but it is dead. It runs toward the south, then, at the slight narrowing at Timguiaouine, it turns sharply toward the northwest. This may be a case of a former capture.

/27/ The valley becomes immense, the rock shelves are no longer perceptible; former water reaches are suspected where the wadi passes between two hills, but the course has the appearance of an absolutely flat and sterile reg, except toward the middle, where the presence of a few tufts of dried afazzou /Panicum turgidum/ shows that a modest trickle of water sometimes reaches this zone. Near a gara /butte/ encircled by pre-Islamic tombs, the Adjelman wadi meets the Tamanrasset wadi, but its waters cannot pass through because a barrier of dunes blocks its mouth. The Adjelman, which is four kilometers wide

133
312

/27 cont./ at this place, will have a closed basin from now on. One cannot imagine a flood powerful enough to sweep away the sand-dune system which plugs the confluent.

Up to the Tassili de Timissao, the wadi appears to stretch out as far as eye can reach; it may be from 20 to 30 kilometers wide. It is a magnificent reg over which vehicles drive as if on a highway.

A few tahlas dot the course toward the center of the valley; dry stalks of gergir bear witness to a more humid time of long ago.

The confluent wadi Amded is obstructed by a large dune system; here again is a case of a large tributary having an independent basin, and its waters can no longer pass the sandy barrier which blocks their access to the Tamanrasset wadi. However, the Amded has vegetation up to its mouth during a wet year, such as 1950; at the very end of its course I have seen tufts of "had" and a few green tufts of morakba.

I have not personally followed the Tamanrasset wadi beyond Timissao; I have only the information supplied by the Tuareg, chiefly by the Kel-Ahnet.

The Ilafer wadi empties into the Tamanrasset wadi. Their junction forms an outsized flat, an immense sebkha, the final outlet for waters from such a flood as would be inconceivable in the Ahaggar at this time. Up until this point the course of the Tamanrasset wadi has been unobstructed, but, a little east of one degree longitude, it comes up against the Egtelis Erg. This is the present end of the wadi.

I have not been able to obtain any information about the extreme downstream course; it would require painstaking surveys to mark /28/ the ancient quaternary course, which is thought to have gone toward Taoudéni.

The flow of the wadi depends on the rains in the central Ahaggar, which is to say that it is extremely irregular. When, by chance, its upper tributaries -- including the Ajemet wadi -- are flowing, the water may reach to the low flats as far as

133 /28 cont. / Timissao, or so the Tuareg tell me, although I have
312 never been able to determine when such a phenomenon last occurred. In 1948, I witnessed a flood; ten millimeters of rain fell in twelve minutes at Tamanrasset, but it was impossible to tell how hard and how long it rained in the mountains; four hours after the rain, the waters arrived like a rising tide, pushing the light detritus and, in effect, cleaning the wadi. At the end of a quarter of an hour, the water in the wadi measured 200 meters across; one could still cross the current with the water halfway up the thighs, leaning sharply to counteract the force of it, and a number of little pebbles could be felt pelting the legs. The flood lasted five hours. It reached only to Amsel, and only the tributaries above Tagrambaït were flowing. This flood, which, seen from Tamanrasset, appeared so considerable, resulted in only a slight infiltration of water, for the underground water level had only an insignificant rise.

Other than in the system of living and dead wadis, of which the Tamanrasset is only one example, water is found fairly deep under ground in the tassilis and close to them, due, no doubt, to the permeability of the sandstone.

312 Men may, then, obtain water for their use in several ways. The Tuareg know how to find, near the rock shelves and upstream of them, the place to dig down from 20 to 50 centimeters with a menassa /copper basin/ until the water seeps out: this type of water point is called an "abankor." The true well, the large one found along the caravan trails, is called "anou" (plural: "ounan").

The presence of these large wells is signaled from very far away by large redjems on the hills. Many paths seem to converge on a mysterious point; the nearer one approaches, the denser becomes the network of paths; then appears /29/ a vast trampled circle, strewn with camel droppings, and in the middle of this circle is the well.

The Tuareg have another name for the well used to irrigate the gardens: this is the "tanout" (plural: "tounin"). These

312 /29 cont./ shallow wells are found in agricultural centers; generally, they are upstream from the rock shelves. The water is drawn by men or, most often, by an ox, in which case a rudimentary scaffolding supports a pulley by which a goatskin full of water may be drawn up and dumped into a basin by an ingenious system.

The last method used to tap underground water is the foggara, called by the natives the "efeli" (plural: "ifelan"). The foggara is used only to irrigate gardens; we shall see how it works when we study agriculture.

Flora and Fauna

137 [114] The flora of the Ahaggar is more varied than that of the northern Sahara. The work of M. Maire constitutes the basic study one should refer to for information on the spontaneous vegetation. The list of plants given in the appendix was established by questioning the Tuareg in order to learn the varieties most often encountered. Very incomplete as far as herbaceous vegetation is concerned, this enumeration includes the vast majority of trees growing naturally.

There is no forest in the Ahaggar. However, information from the Kel Immidir Tuareg makes it possible to suppose the existence of a wooded stretch in the Ifetessen massif, a region still not thoroughly explored in its entirety. Perhaps it may merely be a case of wadis covered with a particularly luxuriant vegetation. In the Ahaggar almost all the flora grows in wadis. A few plants also grow on the most watered high summits, and, at the time of particularly propitious rains, the regs are covered with patches of acheb /pasturage/, which resemble a thick, sprouting beard.

The distribution of the spontaneous flora in the Ahaggar obviously /30/ is related to the climatic zones we have already discussed. There are some plants which are peculiar to a specific zone, while there is an interpenetration of most of the other vegetation.

• 312 /71 cont./ Irrigation is the main problem here. It is solved by a foggara called "efeli" in Tamashek (plural: "ifelan"), which doesn't at all resemble the foggaguir of the Tidikelt and the Touat, which are permanent and require a great deal of work. In the Ahaggar the foggara is, in effect, nothing more than an underground séguia (irrigation canal) designed to tap the water of a wadi water table upstream from a cultivable plot; the water is channeled downhill following the most gradual incline to the gardens, which are irrigated by gravity.

The digging of a foggara involves several operations. First, a hole is bored upstream to reach the water and show its depth; then five or six wells are dug and are connected by an underground canal. This makes it possible to judge how large a flow may be expected. Three men work together: one digs, the other two stay at the surface, one on each side of the well, and lower a basket tied with two ropes on each handle. They throw the excavated soil to the right and left of the well.

Starting at the garden to be irrigated, a séguia is set up going in the direction of the wells upstream; this involves making embankments at first, and then further along digging into the ground as long as the alluvial soil will hold up without caving in.

/72/ Between the séguia downstream and the wells upstream other wells are then dug at intervals of five meters, connected by a tunnel. The work is done going in the upstream direction. A specialist arranges for the optimum grade following the usual practice, which calls for an ankle-depth difference between wells, or about two centimeters per meter.

When all these intermediate wells and tunnels are ready, the last tunnel (A), which connects the downstream system to the initial upstream wells, is opened. The foggara is then finished, and the water goes to feed the "majen," that is, the holding basin from which the irrigation séguias start.

312 /72 cont./ It takes one or two months to establish a foggara. Some of them (Abalessa) are six kilometers long, and the upsteam wells are ten to 12 meters deep.

When the flow diminishes, other wells are sunk upstream, but in certain agricultural centers, such as Ideles and Tahart, the bottom of the sand layer is reached, and the workers find themselves confronted with large rocks; the work then stops, as it is difficult to cope with rocks with a hoe and basket. There is nothing left to do but pray for rain to replenish the water table, or to emigrate to a more favored center.

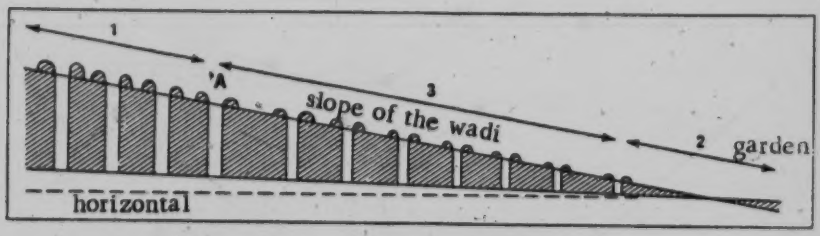


Diagram showing how a foggara is dug.

The work is dangerous in these foggaras sunk in the loose alluvial soil, and accidents often happen. The foggara requires continual maintenance work; blown sand dries up and clogs the wells, warping of land occurs which obstruct the flow, and cave-ins are frequent. In /73/ the event of a cave-in, a work party of volunteers pitches in to repair the damage rapidly in order to protect the crop.

The beneficial flood which makes the level of the water table rise also destroys the work of the harratin, by choking up a large number of wells; the foggara must then be reconstructed. At Tamanrasset recently was tried the construction of an underground drain made with small stones spread over larger ones and then covered with clay and sand, in order to permit the flood to pass without damage to the foggara. But the Negroes are not able to undertake this kind of work.

312 /73 cont./ The water flowing constantly from the foggara is accumulated in a basin 8 meters by 4 meters by .40 meters large; these dimensions give the approximate size. From this basin, walled in by earth levees and made watertight by clay, the gardener runs the water into the séguias, which channel it to the guemouns under cultivation, which are inundated.

This irrigation system rapidly exhausts the soil.

The crops are watered every six or eight days, with each of the six or eight gardens dependent on the foggara having its regular turn at the water.

When the irrigation is made from a well (tanout) instead of from a foggara, the water is drawn from the well manually or with the help of a zebu. When the majen is full, the gardener proceeds with the inundation of the guemouns.

241 The cultivable land, which is quickly impoverished, needs rest. The harratin let land lie fallow, but involuntarily, for fairly large areas remain uncultivated because of the lack of water or of seed. It even happens that, the land being exhausted, a center is abandoned for a certain time.

The plants cultivated in the Ahaggar are few: wheat and barley in the winter, millet and tomatoes in the summer in fact constitute most of the production and cover nearly all of the cultivated land. Kitchen gardening is negligible, and in many centers nonexistent.

In the Ahaggar there are five varieties of soft wheat, probably imported from the Touat.

The wheat is sown in October and harvested at the beginning of May. /74/ It is grown on small guemouna about 1.50 meters by 3.0 meters large. It is irrigated every six or eight days. Along the séguias, two parallel lines of wheat are planted. The yield varies from ten to 15 for one. It is about 300 to 400 kilograms per hectare. The total production of the Ahaggar is about 200 metric tons of wheat per year.

Barley is cultivated in the same way as wheat, but only 50 metric tons a year are produced.

6:Blanguernon--155 Y-5 (1937-1954) 1955 MS25 Tuareg MS25
Hoggar

/167/ Remarks on the Rainfall

132 M. Dubief of the Algiers Institut de physique du globe has made a very interesting study of the rainfall in the Ahaggar territory, using information furnished by the Tuareg and covering 80 years for the central Ahaggar and 60 years for the Ahnet and the Mouydir.

This research shows that the system of rains in the central Ahaggar is unrelated to that of the northern Sahara.

Moreover, the distribution of the rains in the central Ahaggar has some relation to the distribution in the Tefedest, little to that of the Mouydir, and none to that of the Ahnet; it is completely independent of the Tamesna.

Finally, the dry periods do not seem to exceed seven years (the term "dry" is not used here in its meteorological sense, but relatively speaking, indicating for the nomads a lack of pastures).

Some Tuareg claim to have observed a cycle of seven years in the duration of the ground-water level.

The observations made at Tamanrasset record as years of heavy precipitation: 1924, 1933, 1943, and 1951, which would give a cycle of about nine years.

/169/ IV

Wells or Water Points on the Caravan Trails

From Tamanrasset to Tin-Zaouaten

103 Amsel: Tiggert /natural outflow of water/ and tanout
312 /well for irrigating gardens/. Permanent agricultural center.

Tin-Tounatine: Tigget /sic/ and abankor /water hole/ in the Tamanrasset wadi.

103
312 /169 cont./ Amselka: Permanent well in the Tamanrasset wadi.

Tinef: Permanent, plentifully filled well, 1.20 meters deep, in the Tamanrasset wadi.

In-Abalesse: Permanent abankor, 0.50 meters deep, in the Tamanrasset wadi.

Tidjenaouine: Agricultural center in the Tamanrasset wadi.

In-Amelloutine: Plentifully filled abankor, 0.60 meters deep, in the Tamanrasset wadi.

Timdjaouine: Ten kilometers south of the Tamanrasset wadi, Mount Debla, fairly plentiful water, ten meters deep.

Abankor ouan Mellouline: In the Immazarène Tin-Reroh wadi, east of the tassili. Not very plentiful.

Tin-Reroh: In the tassili, plentiful, permanent, 40 kilometers from the automobile road.

In el Tobol: In the Adrar in el Tobol, not very plentiful, 15 kilometers from the automobile road.

In-Tedeini: Six kilometers north of Tin-Zaouaten, permanent, ten meters deep, shored up with gasoline drums, three kilometers from the automobile road.

/170/ Tin-Elhaoua: In the Tin-Elhaoua wadi, ten kilometers north of Tin-Zaouaten. Lined shaft, with stone drain, never dry.

Tin-Zaouaten: Three wells, a temporary guelta /natural pool/.

From Tamanrasset in the direction of Tessalit (Sudan)

Up to Silet, various agricultural centers.

Timissao: Well in the wadi, north of the tassili, shored up with stones. Very plentiful water, nevery dar. Depth: six meters.

Tamada: Temporary guelta, rarely dry, east of the tassili, surface about five meters square; very deep.

103
•312 /170 cont./ In-Azaoua: Southwest edge of the tassili. Well, 1.50 meters, never dry.

Tiggueurt: Copious spring, in a tassili valley, three hours' march southeast of In-Azaoua, two hours to the west of Tamada. Site unusual because of verdure.

Aguelman de l'oued En-Nefis: Temporary guelta two hours' march from In-Azaoua.

Ameg: Permanent guelta in an outlier of the tassili, south of Tirek, at the head of the In-Allarène wadi.

Tirek: Permanent guelta, plentiful water, in the northern part of the Tirek ta Settefet tassili.

In-Ouzzal: In the In-Ouzzal wadi, near the confluence of the Ighelian wadi. Plentiful. Depth: eight meters.

In-Djezzal: Plentifully filled well, never dry, 23 meters deep.

Timiaouine: Permanent lined well, never dry, eight meters deep.

From the Adrar des Iforas (Timiaouine) toward the Tidikelt

The wells of Ilafok and Guernen are filled in; in winter the caravans go straight to In-Ziza, in summer they pass by Timissao.

In-Ziza: Very large guelta, about 20 meters square, varying from five to ten meters in depth, never dry. There are 17 others.

/171/ Aït el Kra: Very copious tiggert in the tassili sandstone near Foum-Ezgag.

Tin-Senasset: Fairly copious spring.

Tin-Eddi: Poorly filled well, sometimes dry.

Tin-Akhenfous: Permanent well.

Tikebetatine: Four or five springs, fairly copious flow.

In-Rhellal: Poorly filled well, 150 kilometers from the first wells of the Tidikelt.

/171 cont./ From Tamanrasset toward In-Salah

103
312

By the automobile road:
Outoul: Agricultural center.
Tit: Agricultural center.
Tilok: Well.
In-Amguel: Agricultural center.
Iniker: Plentifully filled well.
Tesnou: Plentifully filled well.
Amsir: Well.
Meniet: Well.
Arak: Tiggert and guelta.
Tadjmout: Agricultural center, spring.
In-Takoula: Well.
Tiguelguemine: Guelta.
Djoraf: Hot spring.
Hassi el Khenig: Brackish water.

By the camel trail, west of the automobile road.
From Tamanrasset to Abalessa: Various agricultural centers.
Tin-Felki: Large well, never dry, in the Tekouiat wadi.
Tinn-Maroka: Very plentifully filled well in the Afesfes wadi.
Amsir or Arak.
Hassi Takoumbaret: Permanent.
Hassi Belrem: Plentiful, last well before the Tidikelt.

/172/ List of Selected Wadis

Atakor region:
Northern slope, whose waters are collected by the In-Amguel wadi, which flows toward the Tekouiat and which loses itself in the Tanezrouft to the south of In-Zize.

/172 cont./

103
312

Issakarassène wadi
Hirafok wadi
Ifrak wadi
Tidjilgaouine wadi
Abdassène wadi
Zerzoua wadi
In-Tehoulli wadi
} toward the In-Amguel wadi

Southern slope, whose waters are drained by the great Zazir and Tin-Amzi wadis, which flow toward the valley of the Azaouak.

Tefougigine wadi
Ihérane wadi
Izerzi wadi
Ihoular wadi
Taguiemoute wadi
In-Tarkit wadi
} toward the Tin-Amzi wadi

Teredjine wadi
Effeg wadi
Anfeg wadi
Tihararte wadi
Ahahabarougue wadi
Téguerine wadi
} toward the Zazir wadi

In-Dalag wadi
Tahifet wadi
Tarahouaout wadi
Foutès wadi
} toward Irharraar (southern)

Eastern slope, whose waters flow toward the Tin-Tarabin /173/ wadi, which itself joins the valley of the Azaouak.

Itakaline wadi
Azrou wadi
Tiférefine wadi
Tilékine wadi
Sersouf wadi (of Aïtoklane)
} toward Tin-Tarabin

/173 cont./

103 312
Afrahounine wadi
Tibelarhlarhène wadi
Tigoulgouline wadi } toward Tin-Tarabin

Telhouat wadi } toward Igharghar (northern)

Western slope, all the waters of which join the Tamanrasset wadi, either directly or by its large affluent, the Amded wadi.

Tilok wadi
Ilaman wadi
Terhenanet wadi
Outoul wadi
Tit wadi
Selbourak wadi
Tiffert wadi
Abalessa wadi } toward the Amded wadi

Tisatine ouan Tiratine wadi
Tinef wadi (which drains the waters of the Tahelra)
Imezzarene ouan Tin-Reroh wadi
Silet wadi
Aguelman wadi } toward the Tamanrasset wadi

Region north of the Adrar des Iforas and of the southern tassili

Slope of the Tamanrasset wadi:

Inouzzal wadi
Ilafer wadi
/174/ Ilafok wadi
In-Kadiouène wadi
Temesguidda wadi
Tirek wadi
Iller wadi

Slope of the Azaouak:

Tin-Zaouaten wadi
In-Atankarer wadi

/174 cont./

103
312 Anesbaraka wadi
Slope of the Timersoï wadi:
Izedelazen wadi

Region of the Tefedest:

Western slope of the Tefedest: the waters flow toward the Tekouiat wadi.

Ohet wadi
In-Takoufi wadi
Idjioualène wadi
Sersouf wadi
Mertoutek wadi
Abezzou wadi
Adenek wadi
In-Ebeggi wadi

Eastern slope of the Tefedest: all of the waters empty into the great Igharghar.

Taharakit wadi
Idelès wadi
Dehine wadi
Aguelmam wadi
Ousselatine wadi
In-Berhadjane wadi
Tin-Kerkoz wadi
Amrha wadi
Ahatès wadi
} toward Igharghar

/175/ Southern slope of the Tefedest:

Takormiasse wadi
Aethès wadi
Tin-Eleft wadi
} toward the In-Amguel wadi

Region of the Immidir and the Ahnet:

The waters flow chiefly toward the north, losing themselves in the sebkha of the Tidikelt; they are mainly drained by the Botha and Djaret wadis.

/175 cont./

103 Arak wadi
312 Gourdane wadi
Tadjmout wadi
Tiratimine wadi
Tibratine wadi
Takoula wadi
Takoumbaret wadi
Asabaï wadi
Amguid region, slope of the Igharghar:
et Tarara wadi
Hesses wadi
Rharis wadi
El Mahek wadi
Teghert wadi
Hamsa wadi
In-Herreki wadi

Region east of the Serkout massif:

This part of the Ahaggar is very little known; the wadis are tributaries of the Tafassasset wadi.

/177/ V

Flora

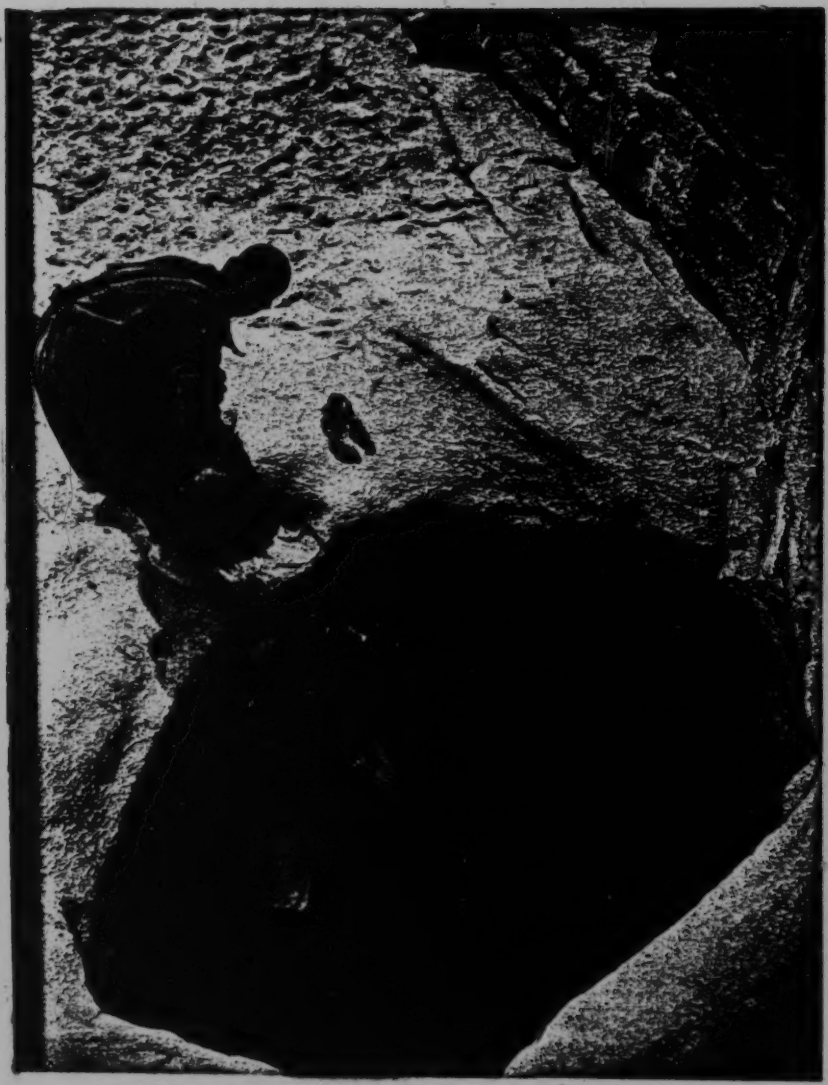
137 Tamahaq 824 Name	Arabic Name	Miscellaneous Observations
Ahtès		Acacia albida. Rare.
Aliou		Olea laperrini. In the high mountains.
Adjiar	El Iatim	Argan tree (?). Hardwood, pasturage for camels, edible berries.

• 312

9. A tanout.

[p. 197]

312



10. Pothole.
[p. 195]

7:Nicolaisen E-5 (1951-1962) 1963 MS25 Tuareg MS25

Fig. 84. Boy and woman mounted on donkeys. Ayr, the *Imezzureg* tribe.

But the wild animals are bigger, which the Tuareg ascribe to the fact that they roam freely in the desert and always can find the very best fodder – an explanation which seems reasonable as the Tuareg camp where fodder is reserved to their milk-yielding animals (cf. p. 491 ff.). It can be added that domestic donkeys are frequently tightly hobbled by means of a narrow rope (*téffart*) around their forelegs (Fig. 45) and sometimes also with another rope (*amahus* in Ahaggar) running from one foreleg to a hind leg.

If donkeys are not hobbled, there is always a great risk that they will disappear in the mountains and join the herds of wild animals. Unhobbled donkeys are often caught with great difficulty. They are sometimes driven together by the inhabitants of a camp, and when mares have foals it may even become necessary to run down the foals on riding camels in order to get hold of their mothers. In some regions where donkeys depend on water from deep wells it is customary not to give them too much water to drink, in which case unhobbled animals can always be caught at the well, where they will wait for water. But donkeys are very well fitted for desert life. They can do without water for several days even when weather is extremely hot, and where water is very near the surface so that the sandy soil is humid donkeys dig small holes with their hoofs to drink the water which quickly gathers in these depressions. I have myself witnessed this in Ahaggar where the Tuareg say that among domestic animals only donkeys are able to make such water-holes.

The Tuareg distinguish between the domestic donkey (*éyhed* in the north, *éyjed* among the Ayr Tuareg) and the wild donkey or ass (*ahullil* in the north, *émedrer* in Ayr), but they are well aware that there is no important distinction between them for many Tuareg even nowadays obtain domestic donkeys by catching wild animals. Wild donkeys or asses were hunted for domestication still more eagerly in the past, and there may perhaps be some connection between donkey-breeding and true hunting – that is hunting for meat. Nowadays the Tuareg never eat donkey's meat, nor do they utilize the skin of these animals. But it is known that the Ahaggar Tuareg have eaten donkey's meat in periods of hunger even fairly recently, and Duveyrier states that old animals caught in traps are killed for their

7:Nicolaisen E-5 (1951-1962) 1963 MS25 Tuareg MS25

household goods during nomadic migrations, and are employed daily in all camps to carry water in skin-bags from wells and waterholes to the tents. They are very strong animals considering their low stature, and good pack-donkeys can carry up to one hundred kilograms even for very long trips. Donkeys are occasionally used for long journeys by the Northern Tuareg, and many Ayr Tuareg use them to fetch provisions of millet around Tanut in Damergu. Caravans of donkeys are frequently observed in these regions, and one even sees mixed caravans of donkeys and camels. There can be no doubt that before the introduction of the camel the donkey was still more important for riding and transportation than is the case nowadays. This is clearly demonstrated by historical material from Egypt and adjacent regions (cf. Erman 1922, p. 518 f., 529, 592 f., 636).

It has already been mentioned that donkey's meat and skin are not utilized nowadays by the Tuareg. The same is true of mare's milk which, however, is used as a remedy against a kind of cough known to the Ayr Tuareg as *khamkhaw*. There is no regulation of mating for donkeys which in many ways are semi-domesticated animals. In Ayr male donkeys are never castrated, while the Ahaggar Tuareg say they castrate such stallions as constantly run after the mares and in this way cause too much trouble. The Tuareg also have no methods to prevent foals from sucking, while a method of this kind is sometimes applied by sedentary people in and around Agadez. This method known as *éfinjar* consists in the cutting of the nostrils of half-grown foals so that they cannot suck pregnant mares. Both stallions and mares are used for riding and transportation, but female animals are much preferred for these purposes. Mares are used almost exclusively for the transportation of water-bags hanging under the animals, as the bags might be squirted by stallions' urine.

The Northern Tuareg saddle their donkeys, using the same saddle type for riding and for transportation (Fig. 86). This is known as *aruku* and is manufactured by the women in the following way:— Two fresh boughs of the *tahunek*-tree (*Rhus oxyacantha*) are heated, or slightly burned, over the fire. The boughs are thereupon barked and bent into the curved form wanted, and are then kept in this position by cords. After drying for a few days the boughs will retain their curved form, and the cords are untied. The boughs are then cut up and their ends are connected by two pieces of camel's hide soaked in water, and sewn together by means of a large iron needle (*tasugla*, or *tasubla*) (cf. Fig. 220b) and a thread which is also cut from camel's hide. The wooden saddle frame is attached to three cushions. These cushions are generally made of goat-skin or sheep-skin stuffed with hay or with date palm bast, but may also be plaited from leaves of the date palm tree. Cushions made from goat-skin are sewn together with strips of the same material by means of the little awl known as *tistent* (cf. Fig. 220a). The two long cushions resting lengthwise upon the animals back are known as *tastek*, and the small cushion resting over the animal's back close to its shoulders is called *tafelledut*. The saddle is fixed to the donkey by two girths consisting of cords made of goat-hair. One of these cords (*tidmechart*) passes under the tail, the other (*ahayif*) is tied around the chest of the animal. This saddle type is well suited for the transportation of burdens and in particular of water-bags, the cords of which are attached to the pommels. When the saddle is used for riding it is frequently covered with a blanket or a piece of cloth. Saddles of this type are found in all camps of the Northern Tuareg, and Lhote states that they are also found in Adrar-n-Foras and in Ayr (Lhote 1947a, p. 120). This may be so, but I have myself never seen them in the latter region where they are unknown to the *Kel Ferwan*.

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Fig. 98. A slave watering goats by means of the leather bucket called *aga*. Water is drawn from a well and poured out into a hole dug in the clayey ground. The goat standing to the left is sheared – a token of the summer season. Tasilé-n-Ajjer.

conditions, and herdsmen, who live with camelherds far away from camps and wells subsisting on camel's milk, do not consider water necessary. Should domestic animals have eaten salt or salty plants they are very eager for water even in winter. When I lived in Ahaggar with my camels during the winter 1954/55 they had rightly to be watered every ten days, but in regions where they fed mainly on saliferous plants they had to be watered more frequently. However, domestic animals must not be watered too often as this would make them slow and emaciated, and a camel must not be worked too hard the day after it has been watered.

Tuareg camps are always found around wells, pools, or other types of water places for which there is a large vocabulary. But the Tuareg never camp too close to water places where there is little pasture, many foreigners and consequently little peace. The distance from camp to water place varies, but is very frequently 1–3 kilometres. During the rainy season (*akasa*) water is very aundant all over Ayr, but outside this period conditions of water supply for human beings and livestock are more favourable in the north than in Ayr, where water most of the year must be drawn from wells. To raise water the Tuareg use a leather bucket known to the Ahaggar Tuareg as *aga* (Fig. 97–98). The water drawn for the animals is poured out into a hole dug in clayey soil, or into a hole covered with a piece of skin or leather known in Ahaggar as *tafarawt*. This skin is nowadays frequently substituted by canvas (cf. Fig. 99). Where water is scarce and must be drawn from narrow wells, as in Ayr during the summer season, the watering of flocks and herds gives rise to frequent quarrels between pastoralists. For though the right to the use of wells is free to all there are many disputes and fights frequently

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start around wells. It may happen, for instance, that two men who draw water from the same well get the ropes of their leather buckets entangled. They will then start to quarrel and the result may be a fight with swords.

I conclude this chapter with a brief description of the signals used by the Tuareg for their domestic animals. As these animals do not have the same needs for food and water and are frequently mixed with each other in camps and around wells, it is only natural that the Tuareg have different signals to call, stop, or drive away their various types of domestic animals. I have noted these signals among the *Kel Ferwan* Tuareg of Southern Ayr:—

Signals to call domestic animals:—

goats	*ay, ay*	
sheep	a rolling sound	the three rolling sounds are somewhat different though resembling each other
cows	a rolling sound	
camels	a rolling sound	
donkeys	*ahay, àhay*	

Signals to stop animals:—

goats	*aw*
sheep, cows, camels	*ôr*
donkeys	*as*

Signals to drive away animals:—

goats	*ây*	pronounced emphatically
sheep, cows, camels	*hey*	
donkeys	*aheyt*	

Fig. 99. Tuareg drawing water for camels which drink from a piece of canvas (*tafarawt*) placed over a hollow in the ground. Ahaggar, the *Kel Ahnet* tribe.

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Fig. 131. A *foggara* canal (*dfell*) dug into the sandy river bed from where it is led into the gardens of the valley terrace. Southern Ahaggar, *Tagnut*.

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[423] In Ayr there are also a few pastoral Tuareg who own date palms growing in river valleys, e.g., people of the *Imezzureg* tribe of the *Kel Ferwan* drum-group. These date palms, like those growing half wild in Northern Tuareg countries, yield very small dates of a quality inferior to those grown in the oases under constant supervision by agriculturists. Such dates are used only for local consumption.

IRRIGATION AGRICULTURE IN AHAGGAR

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175 Irrigation agriculture has been practised since ancient times within certain territories now inhabited by the Northern Tuareg. As early as in Roman times there is reference to *Radames*, *Rat*, and certain oases of the Fezzan, which were visited by Roman Expeditions (Lhote 1955a, p. 113 f.; Duveyrier 1864, p. 249 ff., 266 ff., 275 ff., 455 ff.). Lhote thinks that the oasis of Abalessa in the lowland west of the Ahaggar Massif was also visited by the Roman general Cornelius Balbus (Lhote 1955a, p. 88 f., 113 f., 286), but this, perhaps, is to be doubted. In the writings of Medieval Arab authors there is apparently no reference to oases within the Ahaggar country, though oases in neighbouring parts of the Sahara are mentioned.

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In literature there seems to be no reliable information about the existence of irrigation agriculture in Ahaggar until Duveyrier, who states that agriculture did not obtain a fixed position in the economic life of the Ahaggar Tuareg until the reign of the *Amenukal Elkhaj Akhmed* (1830–1877) (cf. Duveyrier 1864, p. 369). This statement is confirmed by most agriculturists and pastoral Tuareg in Ahaggar, who claim that prior to *Elkhaj Akhmed* irrigation agriculture was not practised in Ahaggar. During the reign of this *Amenukal* irrigation agriculture by means of the subterranean aqueducts known to the Arabs as *foggara* (*ifeli*, pl. *ifelan*) was introduced by *Ahl Azzi* Arabs and negroid *Ḥarratin* from the Tidikelt oases. Some people of Ahaggar claim that another irrigation system was introduced about the same time, namely irrigation wells from which water is drawn by oxen and donkeys. This system, known as *tanut*, is said to have been introduced by agriculturists from Ġanet (Djanet) (the *Kel Ġanet*). It should be noted that there are certain traditions which claim irrigation agriculture to be older in Ahaggar. One tradition says that it was practised at Silet-Tibeghin by Arabs who immigrated from Tawat to cultivate by means of the *foggara* system even during the reign of the *Imenan* (Lhote 1955, p. 286 f.). Another tradition, recorded by Foucauld, states that irrigation farming was known at a very remote date by the *Isebeten* – a pagan people said to be the ancestors of the oldest vassal tribes of Ahaggar (cf. Foucauld 1951–52, II, p. 535 f.). Traditions of the age of irrigation agriculture in Ahaggar are conflicting. If it was practised long before the reign of *Elkhaj Akhmed* by the ancient vassals, I believe that water was raised by human power, namely by the pole and bucket provided with a counter-weight. For this system, which is known as *ajudid*, is said to have been very common in the past. It is extremely rare nowadys, and I have only seen it once at Terhenanet. There can be no doubt that this simple irrigation method is a very old one in North Africa, where it is more widely distributed than all other types of irrigation methods (cf. Capot-Rey 1953a, map VII p. 320). The very wide distribution of this system elsewhere in the Old World points to its great age, and it is perhaps to be considered the oldest true irrigation machine.

A few Tuareg in the northern groups practise irrigation agriculture, which does not seem to be one of their traditional occupations. Tuareg irrigation farmers are found mainly in the Fezzan, but mention should also be made of the people of three noble tribes, namely the *Ilemtéyen* (living at Rat), the *Ikadeyen* (at Tit in Ahaggar), and the *Kel-ahem-niellen* (roaming pastoralists north of Ahaggar or settled farmers at the oasis of Inṛer in Tidikelt). These sedentary or semi-sedentary noble Tuareg were originally true pastoralists, though but little is known of the original mode of livelihood of the *Ikadeyen*. A few individuals or families among the Ahaggar vassals have more recently taken up irrigation agriculture in addition to stock-breeding. There seems to be a growing tendency towards semi-nomadism in Ahaggar nowadays. There may be several reasons for this. Thus one can point to the decline of caravan trading and to the fact that pastoral Tuareg cannot so easily get the true agriculturists to cultivate for them. The true agriculturists of Ahaggar comprise the *Ḥarratin* (*Izeggaren*) of Tidikelt, who have mixed with the manumitted slaves now also known as *Ḥarratin* (*Izeggaren*), a few fair-skinned *Ahl Azzi* Arabs, and the *Kel Ġanet* who are predominantly black-skinned. All these agricultural people tend to mix with each other and also with tribes of pastoral Tuareg.

There are at present about 25 agricultural settlements in the river valleys of Ahaggar. Apart from the administration centre of Tamanṛaset (1600) and the oasis of Abalessa (547) these agricultural

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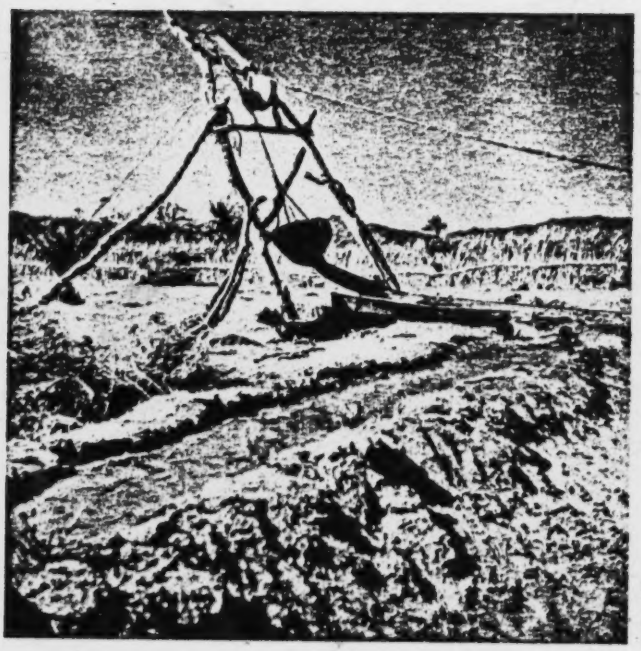

Fig. 132a. The irrigation system known as *tanut*. Ahaggar, Amsel.

settlements contain less than 300 individuals, the majority not even a hundred (cf. Lhote 1955a; p. 292). Most agricultural settlements comprise only a few houses built of stone or mud, or a few straw-huts (cf. p. 327 ff.). The agriculturists of these small settlements generally keep some goats and sheep, have donkeys, which are important beasts of burden to all farmers of the Sahara oases, and in certain families there are one or two zebus to raise water from irrigation wells. A few agriculturists may be characterized as semi-nomads. This is the case of some inhabitants of Abalessa who guard their flocks at some distance from the village. Some of these agriculturists, who were formerly Tuareg slaves, even make skin-tents like pastoral Tuareg.

The subterranean aqueducts known to the Arabs of the Sahara as *foggara*, to the Tuareg as *ifelan* (sing. *éfeli*), constitute by far the most important irrigation system used in Ahaggar. However, these *foggara* canals cannot be compared with the large extensive aqueducts of Tidikelt though their introduction to Ahaggar is due to the immigration of agriculturists from that area. The Tidikelt *foggara* are very large aqueducts which are dug into water-bearing strata which can be situated at a considerable distance from the oasis (cf. Capot-Rey 1953a, p. 324 ff., Lô 1953 & 1954; Chaintron 1958). The Ahaggar foggara are generally very short (about one to two kilometres, or shorter), they are not

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Fig. 132b. Cf. text Fig. 132a.

deep, and are dug into the sandy river bed to lead its water to the gardens of the valley terrace. A map of the foggara aqueducts placed in the river valley of Tarhawhawt is reproduced by Capot-Rey (Capot-Rey 1953a, Fig. 18 p. 328). There are many advantages attached to the use of foggara systems of the Ahaggar type, for once the aqueducts are dug water automatically flows to the garden. But there are also disadvantages. If a foggara valley is heavily flooded after rains and changed into a roaring stream, the aqueducts are destroyed and the crops also. In general it will be necessary to abandon a foggara system after some years, as it must be cleaned at intervals and in time it becomes too dangerous to work in them as subsidences may occur and kill workers. It may also happen that a river valley is not flooded at all for a period of years when it becomes essential to move to another valley, rich in water under the sandy river bed, to make a new foggara there. For all these reasons deserted foggara systems are common in the river valleys of Ahaggar.

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The *foggara* system is unknown south of Ahaggar and has on the whole a rather limited distribution in the Sahara. One reason for this is perhaps that the construction and maintenance of the aqueduct imply the agricultural co-operation of several households. This is not the case with the other common system in Ahaggar, the use of wells (*tunin*, sing. *tanut*) from which water is raised by animal traction. The wells are usually shallow and not very difficult to dig out, and the maintenance of the whole system is usually limited to occasional mendings of the zebu's harness and of the large waterbag. While a foggara canal is always used for the irrigation of several gardens (6–12), the wells are used for single gardens. The irrigation wells are dug into the valley terrace so that they are not destroyed by a flood, and in dry years watering from wells is considered the better system. But in the period when crops need much water irrigation by means of wells is hard work for the garden owner who must drive his ox all day long.

[184] [476]

Irrespective of the system resorted to irrigation of a garden is done in the same manner. Water from the *foggara* aqueduct or water raised from well flows into a large basin (*tihemt*) through a canal

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Fig. 133. The large water basin (*tihemi*) from which water is led into the gardens. Ahaggar, Abalessa.

(*teguhamt*, or *tahaft*) from which another canal (*tahaft*, or *teguhamt*) leads water out into the garden, which is always divided into a large number of garden beds (*igemmmen*, sing. *agemmun*) surrounded by low ridges and separated by narrow irrigation canals. The large water basin serves to regulate watering, which outside of the very cold season is done during the night. A flat stone with a hole in its middle and known as *anefif* is placed between the basin and the canal leading water into the garden; water for irrigating the garden flows through this hole when irrigation is needed at night, while the hole is closed by means of a cotton stopper during the day. The basin is thus filled with water during the day and its water runs into the garden at night (cf. Figs. 131–136).

The irrigation systems described are most important for the cultivation of the winter crops of wheat and barley. The Tuareg word in Ahaggar for wheat is *éred* which is a collective name for several types of wheat known as *elkhamra*, *elmansuri*, *amekkawi*, *rati*, and *menga*. These special names seem to be derived from Arabic (cf. Foucauld 1951–52, III, p. 1058, 1211 & IV, p. 1789; Maire 1933, I, p. 246). According to Maire these types of wheat belong to the species *Triticum aestivum*. I have never myself seen fully-grown wheat in Ahaggar and was thus unable to collect ears for identification by botanists, but seeds brought home from Ahaggar and Tasilé-n-Ajjer have been identified by Dr. Hans Helbaek as belonging to common bread wheat. Barley is known to the Tuareg as *timzin*. Threshed seeds brought home from Ahaggar have been identified by Dr. Helbaek as belonging to the six-rowed type (*Hordeum vulgare*, though some, he thinks are perhaps of the two-rowed type (*H. distichum*). Barley, like wheat, is a winter crop though less common. At Abalessa I was told that two thirds of the seed-crops grown in winter were wheat, while only one third was barley.

Wheat and barley are grown in the same way. Sowing is done in the autumn (*tober*), and the seeds are put into the garden beds with the fingers. Harvesting takes place in the month of April (*ibri*) and is performed with a sickle (Fig. 143). The growing of wheat and barley is a very strenuous task for irrigation agriculturists. Watering is done for the first time immediately after sowing. When I stayed at Abalessa, in the month of January 1955, the tender plants of wheat and barley were watered two days in succession, and the 10–12 gardens belonging to the same *foggara* were irrigated in succession in this way. At that time of the year the plots are not generally watered at night because of the cold temperatures which may be below zero.

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temperatures which may be below zero. At a later date the plants of wheat and barley are watered less frequently, and watering ceases completely some time before harvesting in order that the plant may ripen more easily.

The agriculturists of Ahaggar do not manure the garden plots used for wheat and barley. Only a new garden plot never previously cultivated is manured, and when such a garden is made the wild vegetation of grasses, herbs, bushes, and trees is often set on fire. Wheat and barley can be grown in the same garden plot for three or four years in succession, and the soil then needs at least one year's rest. In this way, the same garden plot can be kept under cultivation for many years without manuring: this continuous cultivation on the same spot with a one year's rest for each three or four years cultivation is possible partly because there is a certain crop rotation with other plants grown in summer, but mainly because the agriculturists during the period wheat and barley are grown carry fresh soil to their gardens. This is done not only before sowing but also throughout a long period of the winter when the plants are tender and green. When I stayed in the settlements of Abalessa and Amsel in the months of January and February (1955), all agricultural households worked strenuously from morning to night carrying soil to the green garden plots of wheat and barley. The soil was carried in plaited baskets (cf. Fig. 135) on the head, or in bigger baskets carried by donkeys. The soil was left in small heaps (one in every garden bed) to be spread over and between the green plants (cf. Fig. 137). This extremely strenuous work, I was told, would continue until the month of March.

In spite of the fact that cultivation in Ahaggar is done intensively and much work is connected with it, the yield of winter crops is not a very considerable one. In Abalessa it is said that seed-corn of wheat and barley will normally amount to about 50 kgs, and about 500 kgs is to be considered a normal yield, though certain gardens which are extremely well cultivated may yield more and in rare cases up to one thousand kilogrammes. The gardens I saw at Amsel and Taṛhawhawt were smaller than those seen in Abalessa. At Taṛhawhawt the quantity of wheat and barley sown, was said to amount to about 35 kilogrammes.

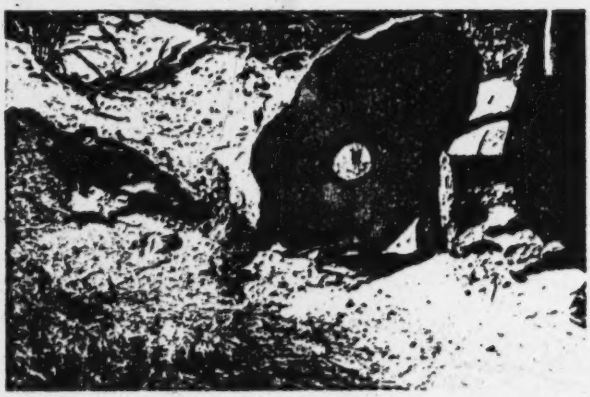

Fig. 134. The flat stone (*aneff*) inserted between the water basin (*tihawt*) and the canal (*tafukant*) which leads water towards the gardens. Irrigation stops and the basin runs full of water when a cotton stopper is put into the round hole in the middle of the flat stone. Ahaggar, *Ahl Azzi* Arabs.

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Fig. 137. The fresh soil carried to old gardens is placed in small heaps to be spread out between the tender plants of wheat and barley. Ahaggar, Abalessa.

241 *andrum sativum*, *Cuminum Cyminum* (*azkar*), *Daucus Carota* (*ezzeruget*), *Cucumis melo*, *Lagenaria vulgaris* (cf. Maire 1933, and particularly Maire 1940, p. 401).

245 [262] In addition to the above-mentioned plants there are various types of fruit trees which do not play any considerable rôle for food. The gardens contain very few date palm trees (*tazzayt*, *Phoenix dactylifera*) and there are no palm trees of any value in the gardens situated in the upper mountain zones where the fig tree (*tahart*, *Ficus carica*) thrives much better than in the lower country; the figs are [251] consumed fresh, or they are put on strings for drying, common practise elsewhere in North Africa. The [386] pomegranate (*terrummant*, *Punica Granatum*) is grown in some gardens; its fruits are eaten, and they are also used for dyeing skins (cf. p. 282). Grapes (*tezzebibt*, *Vitis vinifera*) are also grown in some gardens.

Maire mentions the cultivation of the peach (*Prunus Persica*) and the apricot (*Prunus Armeniaca*) (cf. Maire 1940, p. 401). These fruit trees have undoubtedly been quite recently introduced for Foucauld states that they are not grown in Ahaggar (cf. Foucauld 1951–52, I, p. 79 f.).

243 423 There are nowadays many agriculturists who have their private gardens so that they cultivate their winter crops and their summer crops entirely for their own use. But most agriculturists grow winter crops of wheat and barley on behalf of the Tuareg who are then the true garden owners.

[312] [476] Agriculturists who cultivate their gardens on their own behalf frequently irrigate crops by means of draught animals (zebus) which raise water from wells, but there are also some farmers who cultivate independently without any contract with pastoral Tuareg and nevertheless belong to a *foggara* team.

243 It can be estimated that an independently working agriculturist obtains a total yield of about 700 kilos of wheat and barley grown in winter. Of this yield he gives 10 kilos to the *Amenukal*, or to the

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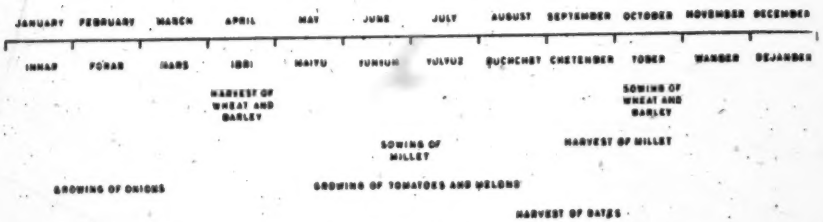

Fig. 139. Horticultural calendar from Ahaggar.

The Tuareg and the negroid agriculturists have a lunar calendar of twelve months corresponding to the Arab calendar, but a lunar calendar has no practical value for the indication of seasonal agricultural activities. The Julian Calendar is known to some people of Ahaggar as well as to other Berbers of the Sahara and the Atlas. Tuareg names of Julian months are given above. Very few people in Ahaggar know the exact beginning and the end of the twelve Julian months, but a few names are used as seasonal terms: *innar* = "midwinter", *mars* = "beginning of spring", *ibri* = "early harvest" (of wheat and barley), *maiyu* = "beginning of summer", *tober* = "late harvest" (millet).

which no definite figures can be given, while the yield of fruit trees growing in the garden plot does not necessarily belong to the agriculturist. These trees frequently belong to pastoral Tuareg.

I think it can be estimated that an agricultural household with its own garden produce about a thousand kilos of vegetables food products annually for its private use. We can add that though the members of an agricultural household live mainly on vegetable food products they also acquire a certain amount of food from livestock, which normally comprises a few goats and sheep, and perhaps one or two zebus. Conditions of stock-breeding are not always favourable to people who live continuously on the same spot, but it is advantageous to the agriculturists of Ahaggar, who live close to valleys with some pasture, that they are able to feed their animals on green garden products when pasture is badly developed and thus avoid the disaster of a drought. It is also an advantage to most agriculturists that they do not have to water their animals which can drink freely from the irrigation canals. The agriculturists can kill a few goats or sheep annually, they obtain milk and a little butter to be used mainly as a sauce for bread and porridge, and they make cheese of the *awles* type (cf. p. 224), but they never make cheese from fresh milk as do many pastoral Tuareg when milk is abundant. The agriculturists also breed fowls and pigeons, and some of them have an important meat supply from hunting with steel-traps (hares, jackals, fennecs, and ravens). Collecting, on the other hand, is of little or no value to irrigation farmers of Ahaggar.

The economic position of agriculturists who work without any particular obligations towards pastoral Tuareg is tolerably good. It is less favourable to those who grow winter crops also on behalf of the Tuareg, as do most cultivators. Some of them irrigate the garden plot with water raised from wells by oxen which may belong to the cultivator or to the Tuareg. But most agriculturists who work for the pastoral Tuareg irrigate by means of *foggara*. It is very strenuous work to dig a *foggara* canal, and co-operation is needed not only for this but also for the maintenance of the whole irrigation system. The gardens are individually tended by the agriculturists, who co-operate in the *foggara* work under the leadership of a headman known as *amɣar n efeli*, that is "chief of the *foggara*". This headman is

7:Nicolaisen E-5 (1951-1962) 1963 MS25 Tuareg MS25

appointed by the Tuareg garden owners and is rewarded by a garden of his own for his responsibility in supervising all co-operative work. The unit of agriculturists co-operating at the same *foggara* may or may not correspond to an extended family. The agriculturists co-operating on any large *foggara* irrigating ten or twelve gardens frequently represent two or three distinct families which are not linked to each other by kinship bonds. The cultivators of a *foggara* comprising nine gardens at Tarhawhawt belong to three distinct, unrelated families. This is quite natural in view of the fact that contracts between the Tuareg and the cultivators are made individually.

There may also be no kinship bonds between the pastoral Tuareg who have gardens at the same foggara, and there are even Tuareg who own two or three gardens situated in widely separated river valleys of Ahaggar. But Tuareg garden owners of the same foggara frequently belong to the same tribe or even to the same tribal section. When a garden-owning Tuareg dies, his garden will generally pass to somebody within his family, but there seems to be no fixed rules governing the transference of gardens.

The individual contract between a Tuareg garden owner and his cultivator is made for a period of six months – the period of growth for wheat and barley. The agriculturist is responsible for all garden work, and the Tuareg garden owner has the following obligations:—

(1) To supply his cultivator with a hoe every year, or every two years in case a very good hoe is given.

(2) To pay for repairs of the *foggara* system, or for the digging of a new *foggara*. This payment is known as *almarsor* and consists of two kilos of cereals or dates every working day until water reaches the garden.

(3) To pay for the making of garden beds. This payment is known as *éhéré n egalab*, and is made only once as long as the garden remains on the same spot. When a garden is moved after a period of three or four years the payment must be made again. It varies with the size of the garden and the quality of its soil; in general it consists of 15–25 kilos of cereals.

Fig. 140. Millet (*énélé*) of very high growth. It is said that this particular millet type was introduced to Ahaggar from the south – possibly from Ayr. Ahaggar, *Ahl Azzi* Arabs.

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Fig. 142. Tomatoes (*tomatem*; *Solanum lycopersicum* and a type of melon (*tazenut*; *Cucurbita* sp.) cut into slices and left upon a layer of straw for drying. A basket (*tésenit*) filled with ears of millet (*énfid*) is seen in the front. Ahaggar, *Ahl Azzi* Arabs.

from Constantinople, and the true *Imeggedezen*, it is said, came from the same region. They were kinsmen of the Sultan who came to see their relative Sultan as guests or visitors and therefore acquired the name "*Imeggedezen*". They founded the city of Agadez, though it is said that sedentary people of the *Itésen* group of Tuareg were already living at this place. The city of Agadez seems to have been founded in the 15th century shortly after the foundation of the Sultanry which was established 1405 A.D. (cf. p. 414 f.). I shall return to the problems connected with the establishment of Agadez in a later chapter, and shall here content myself by saying that Agadez was established as a trading post, which also became the seat of government of Ayr, and the town never seems to have been a true agricultural settlement. There are no gardens, and even drinking water is very scarce and fetched by the women from outside of the city at wells and in river beds. The *Imeggedezen* are mainly city dwellers though there is a small population of agricultural *Imeggedezen* that possesses gardens at Alarses, a few kilometres north-east of Agadez.

In Barth's days the main language of the sedentary Agadez population was *Sonray* (Barth 1857, I, p. 504). This is still spoken by a few people within the city, and it constitutes the traditional language of the people inhabiting the oasis of Ingal (1.430) west of Agadez. These Sonray-speaking people of Ingal, known to the Tuareg as *Isaweren*, subsist mainly upon their palms which yield dates of an excellent quality, and they do not otherwise engage much in agricultural activity. In the winter season some of these people settle in Tegidda-n-tésemt towards the north to work in the salt pits. Trade and crafts are also important industries to the sedentary people of Ingal, which owns a market.

Throughout the Ayr Massif there are many agricultural villages in which the farmers live in straw-huts, and in houses built of stone and mud (cf. p. 327 ff., Figs. 246 ff.). Most people of these villages belong to the group of *Kel Ewey* Tuareg, but there are also some agriculturists who belong to other Tuareg groups, e.g., the *Itésen* (cf. p. 330, 412, 414, 417 f.). The *Kel Ewey* Tuareg originally came from the north as true fair-skinned Tuareg, but in Ayr they mixed with an ancient negroid and Hausa-speaking population that subsisted on agriculture.

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tion that subsisted on agriculture. Most members of the *Kel Ewey* group are fairly negroid in appearance, and though some of them lead a nomadic life and subsist mainly on stock-breeding, the bulk of the *Kel Ewey* are sedentary agriculturists who have some livestock comprising goats, sheep, zebus, and sometimes camels also. Among the fair-skinned Tuareg of the *Kel Ferwan* drum-group there are very few sedentary agriculturists, though a few vassals have taken up irrigation agriculture in recent times. There are also agriculturists within the negroid group of the *Kel Ferwan* known as *Iṛawélen*. Some *Kel Ferwan* Tuareg have gardens cultivated by their slaves, but this is not customary nowadays when slavery is of little importance in Ayr. Contracts between pastoral Tuareg and cultivators are said to have been unknown until recent times when a few pastoralists have made contracts with cultivators. There seem to be no fixed systems regulating such relationships, but it is said to be common for the cultivator and the Tuareg to divide crops equally between them.

Though agriculture could be practised in Ayr without artificial irrigation there are no rain-grown crops within the Massif nowadays. The *foggara* system is unknown, and irrigation is done by raising water from shallow wells. The system of a pole and bucket provided with a counterweight known in Ayr as *aseftan* has disappeared quite recently. It was used at many agricultural settlements of Ayr until a few years ago, and in parts of the country formed the only type of irrigation system at the time of the French occupation. One informant told me that in his boyhood about 35 years ago no other irrigation method was employed at Alarses, and this is in agreement with literature (cf. Capot-Rey 1953a, p. 322). At that time, however, the method of raising water from wells by animal traction (in Ayr *anu*, in Ahaggar *tanut*) was also practised at many settlements. It is unknown when it came to Ayr, but it is said to have been introduced from the north – probably from the regions of Fezzan and Tasilé-n-Ajjer from where the same system came to Ahaggar (cf. p. 187). It is now used at all settlements as the only type of irrigation system, and zebu-oxen are always used for traction. This was not so in the past when zebus were less common than to-day, and it is said that donkeys were then the common draught-animals. The irrigation of gardens is performed in much the same way as in Ahaggar. The water raised from the shallow well (*anu*) is led through a narrow canal (*aṛelal*) to a large basin (*tisemt*) from where another canal (*duki*) leads to the garden (*afarag*), which is divided into a number of beds (*éfeṛal*).

Cereals form the most important crops in Ayr. The common winter crop is wheat (*elkama*; *Triticum vulgare*), but also barley (*Hordeum tetrastichum* var. *pallidum*) is very widely grown. One crop of these two cereals is taken every winter, and it is said that the period of growth is about five months; sowing is done in October, harvest in March. Cereals are also important for summer crops. Both millet (*énélé*; *Pennisetum typhoideum*) and sorghum (*abora*; *Sorghum caudatum*) are grown, and millet, as we have seen, has a very short period of growth – only about two months (cf. p. 184). But though millet is most important as food for agriculturists and pastoral Tuareg alike, it is not widely grown because it is difficult to protect it from the numerous small birds and because, it is said, millet grown in Ayr is of a quality inferior to that of the Sudanese type. Most of the millet eaten in Ayr is therefore imported from Damergu by pastoral Tuareg. By far the most important summer crop grown in Ayr is maize (*Zea mays*), which is known to the Tuareg as *abora maser*, that is "Egyptian sorghum" (*abora* = sorghum; *maser* = Egypt) (the name *maser* is also used to designate the white cotton used for garments